FLIGHT SIMULATOR X TIPS & TRICKS INSIDE!

COMPUTER Pilot

...the Magazine for Desktop Pilots and Flight Simulator Enthusiasts

VOLUME 11 ISSUE 1 JANUARY 2007
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Simkits new Servo driven aircraft gauge kit, especially designed for flight simulation, includes 74 faceplates (30 large, 44 small) and a dedicated USB Controller

- ✓ High Quality *(all injection molded parts)*
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- ✓ Single and Dual pointers
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- ✓ Built-in lighting
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- ✓ Easy to build in 15 minutes
- ✓ Build one out of 40 different models
- ✓ Dedicated Micro Processor Controller included
- ✓ Connects to Microsoft Flight Simulator FS2002, FS2004, FSX and X-Plane *

*To control the gauge from Microsoft Flight Simulator or X-Plane some third party payware software may be needed depending on the flight sim version.

This kit contains all parts to build either one large or one small aircraft gauge with one or two pointers of different shape out of the following parts: 1 large front ring, 1 small front ring, 1 large optical, 1 small optical, 1 housing, 1 set of screws, bolts and nuts, all the different pointers you will ever need, 1 set of adhesive pointer legends, 74 different faceplates, 1 USB microcontroller PCB including lamp for lighting, 1 USB cable, 1 illustrated user manual. There are no special tools required to assemble this gauge and no technical knowledge is required.

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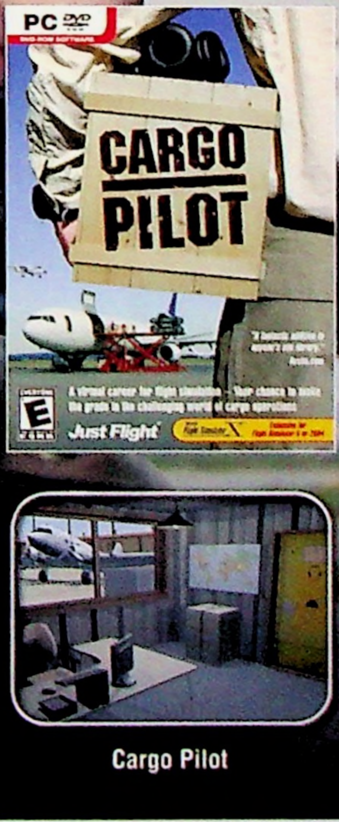
Airbus Collection



Cargo Pilot

F-117A Stealth Fighter

Traffic

Just Flight
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FSX COMPATIBLE ADD-ONS

Expand Your Flight Simulator X world!

My Traffic X

Add Realistic Air Traffic To Your Flight Simulator X Skies!

FSX FS9

MyTraffic X generates more than 475,000 daily flights on 7,800 airports worldwide.From general aviation, regional jets, military aircraft, freight services, right up to the intercontinental airliners, My TrafficX brings the Flight Sim to life. The AI traffic corresponds to the real life air traffic throughout the world. Take-offs and landings take place with the correct aircraft types and airlines on each airport. ATC will address the aircraft with their correct call signs. Many intercontinental flights are taken from the published schedules of the airlines.

MyTraffic X also supports the new features in Flight Simulator X such as the jetways, which dock on to the aircraft, ground vehicles, baggage carts, etc. A total of 154 aircraft types in more than 3,000 liveries are available for the AI traffic display! From a simple single engine aircraft to the Heavies.

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MYTRAFX	*SUB PRICE: US$37.95 // AUD$56.95

Lockheed L-1011 Tristar

Fly The Lockheed L-1011 Tristar With Flight Simulator X!

FSX

Gmax model - Lockheed L-1011 500 Tristar fully animated with superb interior views. Cockpit views includes: Right and Left Seat, Radio Stack, Overhead Panel, Engine Controls. External views includes: Right and Left Side , Landing Gear, Tail, Right and Left Wing.

Detailed Instrument Panels - Panels are very realistic with new custom XML gauges and bitmaps.

Missions - Product includes a set of Missions designed exclusively using the new Flight Simulator X feature. Missions gives you more realistic flight experience recreating a real word ambience with Complete Ai/ATC interaction & more!

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PFTRIS	*SUB PRICE: US$37.95 // AUD$66.45

Fly the Boeing 787 Dreamliner

The Incredible Boeing 787 Will Soon Be Flying The Skies... But You Can Fly It Right Now On Your PC!

FSX FS9

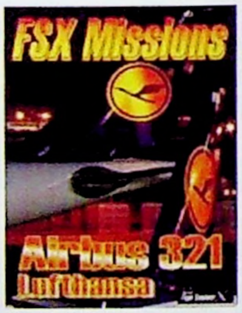
More than 400 of Boeing's newest generation aircraft are scheduled to bring fast, long range and economical flight to the world's major airlines.

With a range of up to 8000 nautical miles , it will wisk 300 passengers in comfort at a speed of Mach .85!

The team of Tolga and Turgot Piskin have modeled the new Boeing 787 for Microsoft Flight Simulator X and FS2004. Graphic artist Ed Knapp has reproduced the many liveries of the airlines both real and vitrual that fly them. Software engineer Peter Jacobson has modeled a custom FMC for ease of flying this new aircraft.

CODE:	PRICE: US$29.95 // AUD$49.95
B787DREAM	*SUB PRICE: US$28.45 // AUD$47.45

FSX Missions - Airbus A321 Lufthansa



One Of The First Boxed Add-ons Utilizing The Flight Simulator X Mission Feature!

FSX

As a new Airbus 321 Captain for Lufthansa airline you have now fifteen flights assignment in your Pilot Loogbook. Missions includes short, middle and long range flights. All Flights are subsequent, as in real life. Your goal in each mission is to complete your scheduled flight following the assigned flightplan. Land in the correct Airport and you will receive a SUCCESS message, as usual in FSX Missions feature

- Reworked stereo engines sounds
- Presaved flights with GPS armed
- Charts and Maps for any Airport included in the Missions
- Complete Flight Briefing

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A321MISS	*SUB PRICE: US$37.95 // AUD$66.45

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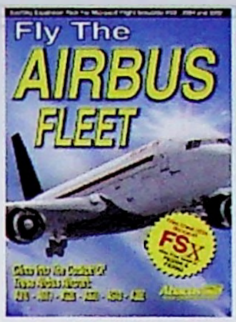
A310, A319, A320, A330, A340 & A350

FSX FS9



The aircraft of the Airbus fleet cover the full range of airline requiements. From the A310 with its old style analog instrumentation to the A350, the newest member that's still on the drawing board, these aircraft serve a very specific segment of the flying public.

This new package include these six models:
A310-300, A319-100, A320-200, A330-300, A340-600, A350-800

Included liveries:
Airbus House Colors, Air India, Lufthansa, German Wings, KLM, Iberia, Air France, Virgin Atlantic, Air Canada, British Airways, Sucaba.

A good package for virtual jet pilot cadets... Not too cumbersome or difficult to fly!

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FLYAIRBUS	*SUB PRICE:	US$28.45 // AUD$47.45

The Modern Airliner Collection - 777

Fly The Largest TwinJet In The World!

FSX FS9

- Highly detailed Boeing 777-200 ER (GE90 engines)
- GMax models
- Simulated systems : fuel, APU, engine startup, air conditioning, electronic checklist and more
- Photorealistic 2D panel w/ multiple views
- Interactive Virtual cockpit
- Realistic animations: hydraulic suspension, flaps, slats, spoilerons, speed brakes, thrust reversers, landing gear, passengers and cargo doors
- High-resolution textures (32 bits)

Procedures guide included written by Captain Mike Ray!

CODE:	PRICE:	US$39.95 // AUD$59.95
WF777	*SUB PRICE:	US$37.95 // AUD$56.95

VFR Real Scenery - England Vol.2

Cover Central & Southern England With This Photorealistic Scenery For FSX!

FSX

Realistic scenery is all very well, but there really is no substitute for the real thing! Just Flight's VFR Real Scenery uses the very latest digital aerial images of the UK to transform Flight Simulator X into the real landscape you can see from the air. With brilliant resolution, night lighting and water effects, this scenery really is as real as it gets!

You can see the real countryside from the air and pinpoint every key landmark. They're all featured – streets, buildings, rivers, lakes, reservoirs... and more!

CODE:	PRICE:	US$39.95 // AUD$64.95
VFRREALUK2	*SUB PRICE:	US$37.95 // AUD$61.70

Luxury Aircraft Collection - Legacy

Break Free And Escape At The Controls Of One Of The Most Prestigious Private Jets Streaking Around The Globe: The Legacy!

FSX FS9

This beautiful, elegant and powerful aircraft offers unrivalled piloting pleasure. It has a "New Generation" flight deck and boasts the latest technological advances: simulation of all on-board systems, head-up display navigation, complete and ultra-realistic flight computer, and more!

- Embark the Legacy and be welcomed and served by an animated flight attendant!
- Truly immersive sound experience with the real plane digitized sounds: engine, APU, batteries, air conditioning, passenger signs, clicks etc
- Full glass cockpit with advanced Honeywell digital avionics, CAT II and III approach logic certified!

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WFLEGACY	*SUB PRICE:	US$37.95 // AUD$56.95

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Add to your virtual FSX Hangar with these quality add-ons...

Flying Club X

Just Flight's Award-Winning General Aviation Expansion Has Now Been Fully Updated For Flight Simulator X And Comes With New Content And Features!

FSX FS9

The four most popular light aircraft in the world - and also the all-new Schweizer 300CBI helicopter - make this the club to join! This is the definitive GA collection in one pack.

Flying Club X features the PA28-161 Warrior, PA38-112 Tomahawk, C152, the twin-engined PA34-200T Seneca II and the Schweizer S300CBi helicopter. All the aircraft have authentic and realistic avionics suites and an additional set of colour schemes as well as the default specimens.

On the S300CBI you can even select if you fly with one or two fuel tanks with the appropriate changes to the flight performance.

CODE: FLYCLUBX
PRICE: US$49.95 // AUD$74.95
*SUB PRICE: US$47.45 // AUD$71.20

F-117A Stealth Fighter

The Nighthawk Casts Its Sinister Shadow Across Flight Simulator!

FSX FS9

Now the distinctive silhouette of the Stealth Fighter (it's actually a bomber) has been sighted in the FSX/FS2004 skies and is ready for any covert operations that you need to undertake.

- Accurate 3D model
- Flight dynamics based on over 50 hours in the real flight simulator
- The airframe surface has been given a realistic reflective sheen
- Custom gauges, effects (navigation lights and cockpit illuminations)
- 'No VC' option for improved performance on lower spec PCs
- Engine exhaust shimmer and smoke turn on according to engine's speed
- Wing vortex and wing vapour according to G force

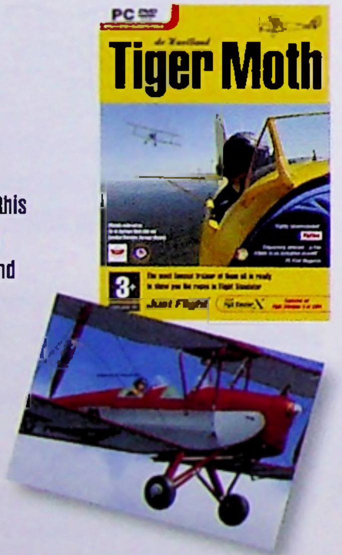
Take the Nighthawk anywhere you want in the FS world!

CODE: F117A
PRICE: US$34.95 // AUD$54.95
*SUB PRICE: US$33.20 // AUD$52.20

Tiger Moth

A Classic Aircraft For A Modern Flight Simulator!

FSX FS9



The crew over at Aeroplane Heaven now bring this classic to Flight Simulator X and FS2004! Highly detailed, the models are exacting in accuracy and have been researched with the kind assistance of the de Havilland Moth Club, the official body that represents and safeguards the Moth range of aircraft.

The high-quality models are accompanied by many high-fidelity animations and superb textures, covering a range of aircraft.

Along with a superb sound set, this Moth is the one to catch!

CODE: TIGERMOTH
PRICE: US$42.95 // AUD$69.95
*SUB PRICE: US$40.80 // AUD$66.45

Airbus Collection

A300, A310 And The Beluga, All In One Great Package!

FSX FS9

A fantastic collection of Airbus aircraft that forms part of Just Flight's F-Lite range of beautifully modelled airliners aimed at the virtual pilot who wants to get airborne as quickly as possible. High in quality but easy to operate, the Airbus Collection includes the incredible A300-600ST Beluga, the A300-600R and the A310.

The software features detailed exterior models, 2D and virtual cockpits and unique effects. There are plenty of liveries and virtual pilots can even use the paint kit to paint their own liveries using a suitable graphics program.

The F-Lite range is designed to provide aircraft that are not only extremely high in detail and visually impressive but also less demanding to fly than complex procedural simulators.

CODE: AIRBUSCOLL
PRICE: US$49.95 // AUD$74.95
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FSX ADD-ONS & FLIGHT DECK DVDs!

Popular add-ons now available for Flight Simulator X!

Cargo Pilot

Can You Handle This?

FSX **FS9**

Cargo Pilot takes you through the life of a hard-pressed Cargo Pilot flying your way through a career starting at small desolate strips with single-engined aircraft and moving up to international operations with massive jets!

Cargo Pilot gives you a structured career in the world of Air Cargo, from flying chickens in and out of Jungle strips to moving racing cars around the World in the 747 Freighter... but, Big Brother is watching you! You will need to fly and operate in a safe and on-time fashion to ensure that you progress onwards and upwards - failure to do so and a life of being stuck in the jungle awaits you!

Run your own air freight company. Open bases around the world to increase the range of your operations. Buy new, bigger aircraft to fly more cargo on longer routes. Use your own aircraft! Fly any aircraft that you have installed in Flight Simulator - if you can afford them, that is!

CODE: CARGOPIL

PRICE: US$49.95 // AUD$74.95
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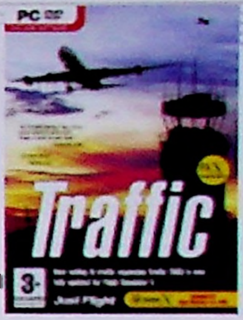
Traffic



New And Enhanced AI Traffic Add-on For Flight Simulator X

FSX **FS9**

Features:

- 280,000+ scheduled airline flights, including international, national, regional, commuter and cargo operators. In addition to these airliner flights the traffic database includes general aviation flights
- More than 500 airlines with more than 1,200 different aircraft
- 1500+ airports with airliner traffic plus additional 1500+ airports/airfields with GA traffic. Each airport in Flight Simulator can be added and scheduled by the user
- All flights are using their correct aircraft/airline identifiers and tail numbers according to the country of origin
- All aircraft are painted in real-world airline liveries (with reflective textures) and real aircraft registrations painted on them

CODE: TRAFFIC

PRICE: US$29.95 // AUD$49.95
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Just Planes DVD - West Jet 737

Fly Canada's Largest Low Cost Airline's B737-700!

WestJet started operations on Feb 29th, 1996 with 3 aircraft. The 737-700 featured on this DVD joined the fleet in 2001. By the end of 2004 the airline had flown more than 32 million guests and by the end of 2005 the average age of the fleet was just 2 years.

This DVD takes you on 10 flights in the cockpit on a nice selection of routes with the pilots giving a lot of details about the routes and destinations, ATC communications and great Canadian and San Francisco scenery ; also included 1 flight filmed from the cabin from Calgary to Toronto.

Running Time: 186 mins

CODE: DVDWESTJET

PRICE: US$29.95 // AUD$49.95
*SUB PRICE: US$28.45 // AUD$47.45

Just Planes DVD - Polynesian Airlines

Featuring The 737-800, Islander And Twin Otter!

Polynesian Airlines has become one of the Pacifics most significant carriers, linking islanders with families and friends abroad and bringing overseas visitors to experience the diverse and unique cultures of the Pacific Islands. Polynesian took delivery of its 1st new generation Boeing 737-800 in November 2000 allowing it to operate nonstop flights from Apia to Sydney and Honolulu.

In this program Polynesian takes you on regional flights operated with its fleet of Islanders & Twin Otters as well as on its modern B737-800 which are equipped with winglets for first class service across the Pacific.

Running Time: 108 mins

CODE: DVDCUB2

PRICE: US$29.95 // AUD$49.95
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Flying the Boeing 700 Series Flight Simulators

The PC Simmer's Guide To Flying Boeing Add-ons At Home...

If you can answer yes to any (or all) of the following questions, then this book should be on your shopping list!

- Are you new to flying heavy jets?
- Are you having trouble understanding the Flight Management Computer (FMC)?
- Do you want to learn all about heavy jets, how to fly them properly, and discover what how the major aircraft systems work and operate?
- Do you want the best book currently available for learning to fly the virtual Boeing aircraft that is written with Flight Simulation in mind?

We highly recomend this book and consider it an essential complementary text for all virtual Boeing jet aviators! You will not find a another book anywhere that teaches the topics in such a unique way!

CODE:	PRICE:
BKB700	US$29.95 // AUD$49.95 *SUB PRICE: US$28.45 // AUD$47.45

Unofficial Boeing 747-400 Simulator Procedures and Techniques Manual

Flying The Boeing 747-400 - For Real Pilots And For Simmers.

This is the latest additon to Captain Mike Ray's other fabulous manuals. If you liked them, you will LOVE this one. Simmers out there will find this manual just the thing for flying just like the airline guys.

Perfect if you own PMDG 747 "Queen Of The Skies"

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BKB747400	US$49.95 // AUD$69.95 *SUB PRICE: US$47.45 // AUD$66.45

Jet Simming

Jet Simming
How to fly propjets, business jets, jetliners, and jumbo jets!

Face The Heaviest Simulation Challenges! Handle The World's Largest Airliners!

Learn about:

- the advantages of simming the jets
- what real-world jet pilots do
- the fundamentals of simming in jets
- performance speeds for jets
- jet panels and instruments
- planning and preparing jet flights
- flying business jets
- flying small, medium and large jetliners
- flying supersonic airliners

Information is divided into relevant chapters, and chapters are organized into easy-to-follow sections. Headings and captions help you find information quickly!

CODE:	PRICE:
BKJS	US$21.95 // AUD$39.95 *SUB PRICE: US$20.85 // AUD$37.95

Unofficial Boeing 757 / 767 Simulator Checkride Procedures Manual

"The Definitve Guide To Undertsnading And Flying The Boeing 757 And 767"

This 320+ plus page volume has undergone over 21 complete re-writes in 8 plus year life, it continues to reflect the latest information and to keep pace with the CHANGE MONSTER. Many pilots representing different carriers throughout the whole world find the material easy to understand, interesting, and entertaining. A MUST HAVE for the "NEW GUY," the Old Hat returning for his Proficiency Checkride, as well as the serious PC "SIMMER." Highly Recommended if you own Level-D 767 or the JustFlight 757!

Presented in a graphical and text format that makes learning, and more importantly, retention and recall of information much easier!

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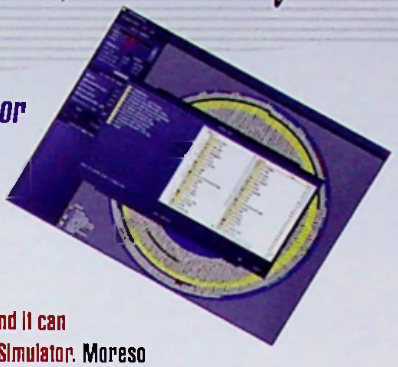

File Fragmentation is the major cause of degraded hard disk performance and it can affect the performance of your Flight Simulator. Moreso if you are using photo-sceneries such as MegaScenery. Fragmentation can be a major cause of slow loading times and blurry scenery where high resolution textures do not kick in fast enough.

There are defraggers out there that defrag your files but they miss out giving you the key defragging operation that only UltimateDefrag has and that is (as well as defragging your fragmented files) enabling you to place your "performance-requiring" files onto the high performing zones of your hard drive.

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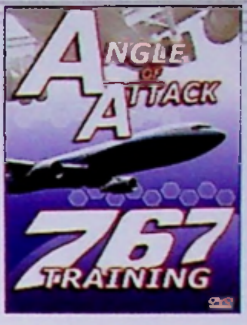
ULTDEF	US$39.95 // AUD$69.95	*SUB PRICE: US$37.95 // AUD$66.45

Angle of Attack: 767 Training

Level-D Simulations 767 Training DVD



Angle of Attack Media's first product trains you in the award winning Level-D Simulations 767-300. This aircraft leads the simulation market with unmatched systems modeling, visually stunning textures and realistic flight characteristics. With this in mind, Angle of Attack drops you in the left seat and envelopes you in an exciting learning environment. In this adventure of sorts, you are committing yourself to a higher level of realism in simulation than you had ever imagined. The 767 DVDs are blessed with input from real world 767 pilots, therefore, you will perform these procedures and methods as they would!

This DVD is region free encoded. It can be played on all DVD players.
A must-have item for Level-D 767 package owners!

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767LDAOA	US$34.95 // AUD$54.95	*SUB PRICE: US$33.20 // AUD$52.20

AudioFX Force Feedback Gaming Headset

Feel The Action With A Built-In Subwoofer And Microphone!

Crystal clear stereo sound and so much more!
The AudioFX headset is a high quality full-ear unit with a microphone certified for superior voice recognition and noise cancellation.
That's just the beginning. Bass-boosting force feedback built right into the headset gives you the complete immersive experience.

Enjoy PC gaming, music and movies with home theater quality sound and bass, all in your own private listening environment! The AudioFX vibrations do not cause any discomfort or shake your head in any way. You have to experience it for yourself. Once you try the AudioFX, it will be your favorite gaming headset!

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EDAUDIO	US$49.95 // AUD$69.95	*SUB PRICE: US$47.45 // AUD$66.45

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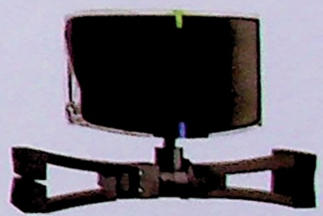
The Ultimate Head Tracking Accessory For Flight Simulation And Gaming, Allowing You To Realistically Pan Your View With Head Movements!



Imagine controlling your field of view in flight simulators, first person shooters, racing sims and many other types of games by simply looking around!

The trackIR uses infrared light to track your head movements in much the same way as ultra-expensive targeting systems used by the military. As you move your head, the trackIR sends a real-time stream of instructions to your computer via USB to move the mouse pointer or pan your view in game play. Compatible with many sims and games including Microsoft Flight Simulator, Lock On, Nascar Sim Racing etc.

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Happy New Year! Welcome to the first issue for 2007, and the first issue in Volume 11. I'm sure we will have yet another fantastic year in the flight simulation hobby.

Who knows what the new year will bring us in terms of software, hardware and peripherals for our pastime? I'm going to make a prediction for 2007... I think the new year will see a big push on new home cockpit devices, and the number of manufacturers will increase as well. We will also start to see more affordable cockpit modules this year than in previous years. Although this is only a prediction, there are certain indicators that are appearing that will have an influence on this area of flight simulation. More suppliers and manufacturers means more competition, which should lower retail prices and increase quality as the competition stiffens. New hardware and technology is now available to make the programming and use of such devices much simpler, leading to more interest from a wider range of simmers, not just the tech-savvy.

I think software development in terms of sims is at a bit of a plateau at present, but will again drive forward as we get further into the new year. The focus in the community at present seems very much to be on hardware and controllers as opposed to new software releases. Much of the developer's time is spent at present attempting to patch older products to be compatible with FSX. As this is completed, I think we will see more new FSX add-ons becoming available. Mission add-ons will be released first, followed by scenery and aircraft further into the year.

For X-plane fans, the growth continues on as it always has, and new builds of the sim are coming out fairly regularly. However, the latest build releases are really pushing forward in terms of sim graphics and panel functionality options, something which the Microsoft line has always held dominance in.

For combat fans, the market is slow at present, but there have been a few combat sim announcements made recently, and we will be following those up in future issues, so stay tuned.

We look forward to your readership throughout 2007. For now, sit back, relax and enjoy the ride...

Dean Bielanowski
Editor

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- **US Distribution:** Ingram Periodicals, International Periodical Distributors, Media Solutions
- **Printed By:** The RL Bryan Company (USA).

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- **Cover Price:** USA.: $7.95. Australia: $9.85*. Canada: $9.95.
- **Subscriptions:**
  Computer Pilot is published monthly
  • Australian Annual Subscription: AUD$79.95
  Phone: 1-800-807-747
  • US Annual Subscription: USD$39.95
  Phone: 1-800-664-0033
  • Other International Subscriptions
  Asia/Pacific Region: Ph: +61-3-9532-8258
  Rest Of The World: Ph: +1-843-232-1160
  or visit www.computerpilot.com

  ISSN: 1324-7336
- **Published by:** PC Aviator – The Flight Simulation Company
- **Australian Office:** The PC Aviator Pty Ltd
  Suite 6, 219 Balaclava Rd
  North Caulfield, Vic, 3161
  Ph: 03-9532-8258 Fax: 03-9532-8916
- **U.S. Office:** PC Aviator Inc
  839 Surfside Drive
  Surfside Beach, SC, 29575
  Ph: 843-232-1160 Fax: 843-232-1166

* Recommended Retail Price only

Computer Pilot is an international magazine, proudly published in Australia. Printed in the United States of America.

Computer Pilot Volume 11 Issue 1, January 2007 (ISSN 1324-7336) is published monthly
by PC Aviator, inc., 839 Surfside Drive, SC 29575.
Periodicals postage is paid at Myrtle Beach, SC and additional mailing offices
POSTMASTER: Send address changes to P.O. Box 15907, Surfside Beach, SC 29587.

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SP1 for FSX SDK!

THE FSX development team have recently released a 90mb update for the FSX Software Development Kit (SDK). The update can be found on the FSinsider.com Developer Community website at **http://www.fsinsider.com/Community/Developers-Corner**

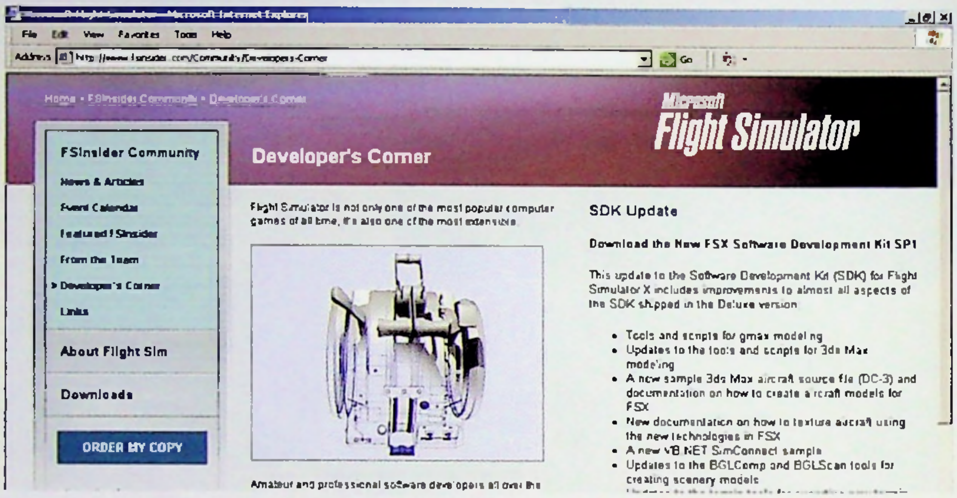
The SDK team released the following information regarding the SP1 update:

This update to the Software Development Kit (SDK) for Flight Simulator X includes improvements to almost all aspects of the SDK shipped in the Deluxe version:

- Tools and scripts for gmax modeling
- Updates to the tools and scripts for 3ds Max modeling
- A new sample 3ds Max aircraft source file (DC-3) and documentation on how to create aircraft models for FSX
- New documentation on how to texture aircraft using the new technologies in FSX
- A new VB.NET SimConnect sample
- Updates to the BGLComp and BGLScan tools for creating scenery models
- Updates to the terrain tools for exporting new terrain imagery
- Updates to the autogen library object list and annotator tool
- Updated header file for creating code gauges
- A new gauge sample showing how to link an XML gauge with the C++ gauge callback mechanism (Cabin_Comfort)
- Various other documentation updates to correct errors and/or add additional information for more clarity

Please note that this update requires the installation of the original SDK from the Deluxe version of FSX. Check the website for future updates to assist in you in building add-ons for Flight Simulator X.

If you are into developing add-ons or making modifications to your FSX world, be sure to grab the newest SDK to be sure you are working with the latest updates and information.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SDK Update

Download the New FSX Software Development Kit SP1

This update to the Software Development Kit (SDK) for Flight Simulator X includes improvements to almost all aspects of the SDK shipped in the Deluxe version

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- Updates to the tools and scripts for 3ds Max modeling
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- New documentation on how to texture aircraft using the new technologies in FSX
- A new VB.NET SimConnect sample
- Updates to the BGLComp and BGLScan tools for creating scenery models

Flight1 Releases FSDiscover!

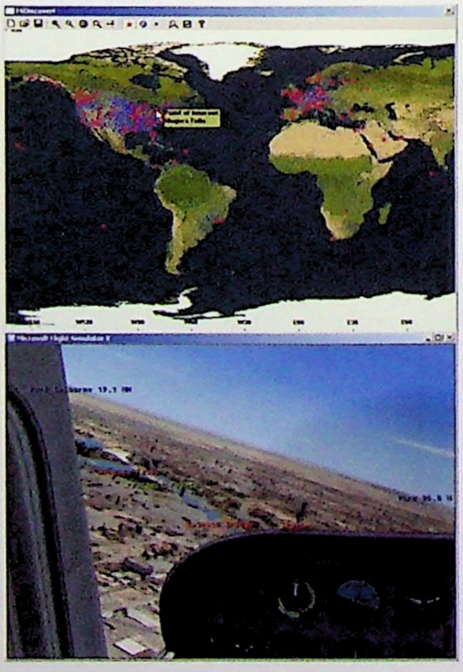
FSDISCOVER! provides a virtual tour guide for your FSX and FS2004 worlds and is available now from **Flight1.com** via download for US$29.95. A boxed version is expected to be available shortly too.

"FSDiscover! is a Flight Simulator sightseeing guide, a navigation tool, and a simple flight planner, all in one single product for Flight Simulator X and Flight Simulator 2004. FSDiscover! is preloaded with over 3.6 million geographic names from all over the world. There are also 1900 specialized points of interest for FSX, and 600 specialized points of interest for FS2004, including all the "Easter eggs" and unique landmark buildings within these simulators.

Some of the geographic features that will be identified include: Mountains, Streams, Valleys, Beaches, Rapids, Parks, Lakes, Islands, Harbors, Glaciers, Forests, Waterfalls, Canals, Bridges, Dams, and much more!

FSDiscover! offers an easy-to-use map where you can see airports, points of interest, geographic features, and your custom FSDiscover! flight plan. All this information can be displayed in your 3D Flight Simulator world. Labels along the terrain describe each geographic or specialized feature, and special visual flight path markings follow the terrain along your programmed flight plan. The flight planning features allow you to plan simple to elaborate sightseeing excursions all in a simple point and click interface inside Flight Simulator. You can either follow them yourself, or let FSDiscover! use your autopilot to help guide your plane to your destinations."

If you always wondered what that funny looking building actually was, or perhaps what lake you are flying over, FSDiscover! will likely have the answer!



CH Products Ship Multi-Function Panel

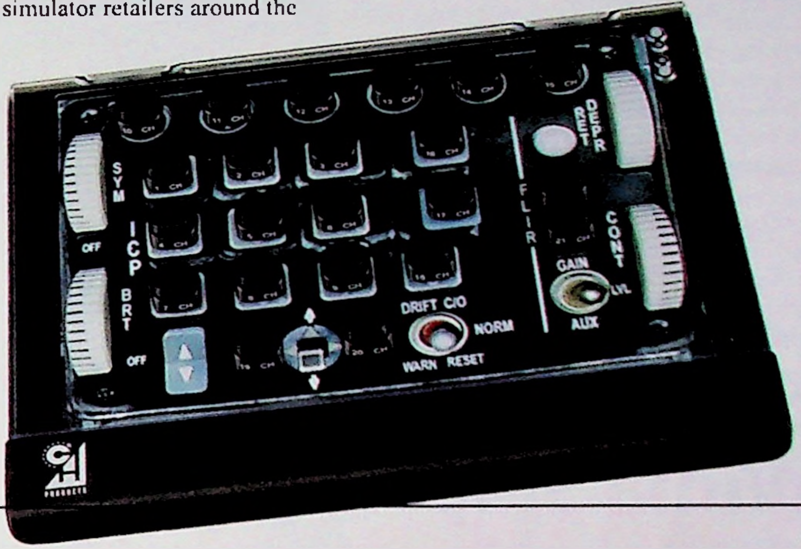
AN EXCITING new flight sim control accessory has just starting shipping from the folks at CH Products – the CH Multi-Function Panel (CH MFP).
Each MFP features 25 removable keys which can be positioned and re-positioned to any location on the panel's "active surface", making each device completely customizable by the user.

The MFP also includes a removable clear tray that allows users to create custom key templates to be placed underneath the tray aiding in the identification of key placement and adding realism. Each key can perform as any combination of the following:

- **Keystrokes**
- **Joystick**
- **Buttons**
- **Mouse buttons**
- **Joystick axis**
- **Mouse axis with the CH Control Manager software (included).**

Users will also be able to download a number of popular function templates from the CH Products website (in the tech support section).

The CH MFP has the potential to be used in a lot of ways and with many of your favorite simulators and mainstream games and perhaps even for applications too! The MFPs are compatible with all versions of Windows from 98 upwards, including XP 64-bit edition. At present there is no mention of Windows Vista compatibility but it is likely to be compatible also. Check the CH Products website at **www.chproducts.com** for the latest information. The CH MFP retails for US$189.95 and can be found at good flight simulator retailers around the world.



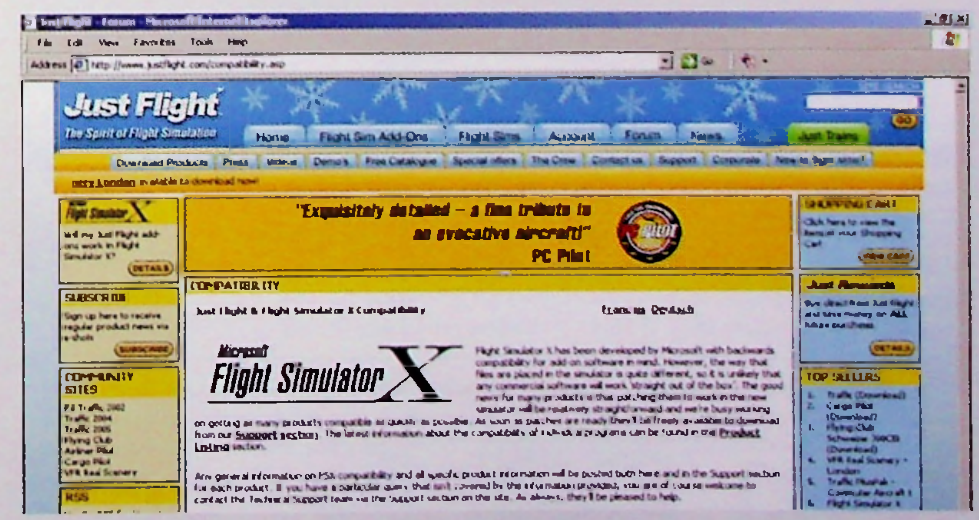
Just Flight Announces FSX Compatible Lineup

WITH THE RELEASE of Flight Simulator X, add-on developers and publishers are attempting to make some of their existing titles FSX compatible. UK publisher, Just Flight, have recently announced a set of existing and new titles that will work with the new simulator version:

"Just Flight is pleased to announce that a number of its most popular titles have now been fully updated to Flight Simulator X compatibility and are shipping out over the next two weeks. Tiger Moth, F-117A Stealth Fighter, Cargo Pilot and Traffic are out now with Airbus Collection and Flying Club X scheduled for next week. A340-500/600 will be airborne in FSX during January.

Richard Slater, heading up the Flight Simulator update project at Just Flight said: "We've worked to make sure every title we update is fully compatible with Flight Simulator X. Our installation programs have been re-written for FSX to make sure that users can load the software without any fuss and, of course, existing owners of these titles can update their copies for free via our dedicated update site – **www.justflightfsx.com**"

For information on whether other add-ons are compatible with Flight Simulator X, check the respective developer's or publisher's website for update or compatibility information.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Just Flight
The Spirit of Flight Simulation
Home
Flight Sim Add-Ons
Flight Sims
Account
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GO
DETAILS
SUBSCRIBE
"Exquisitely detailed – a fine tribute to an evocative aircraft"
PC Pilot
COMPATIBILITY
Microsoft Flight Simulator X
COMMUNITY SITES
RSS
TOP SELLERS

Saitek Announce X52 Pro Flight Control System

GAME controller and peripheral manufacturer, Saitek, have announced the successor to their X52 Flight Control System (FCS) – the X52 Pro. The X52 Pro not only sports a new black color scheme, but several key upgrades that provide more functionality. The X52 Pro features "all the features of the X52 combined with premium engineering and advanced Multi-Function Display (MFD) for real flying interaction." Some of the key features include:

- MFD displays data directly from games, including Radio Stack info from Microsoft Flight Simulator 9 and 10
- Software Development Kit included for creating game-specific programs to interact with the MFD
- Choice of red, amber or green button illumination
- Enhanced MFD backlighting

Joystick Features:

- Precision centering mechanism, non-contact technology on X and Y axes and constant spring force reduce free play, improve control and increase durability
- 2-stage metal trigger; 2 primary buttons in 1 convenient position
- 4 fire buttons including missile launcher with spring-loaded safety cover for instant access
- Conveniently positioned metal pinkie switch provides shift functionality to double up on programmable commands
- 2 x 8-way Hat Switches
- 3D rudder twist
- 3-position rotary mode selector switch with LED indicators
- 3 spring-loaded, base-mounted toggle switches for up to 6 programmable flight commands
- 5-position handle adjustment system to suit all hand sizes

Throttle Features

- Progressive throttle with tension adjustment, detents for afterburner and idle
- 2 fire buttons
- Scroll wheel with built-in button
- Mouse controller / hat switch with left mouse button
- 8-way hat switch
- 2 x rotary controls
- Smooth-action slider control
- Clutch button initiates 'safe mode' to allow on-the-fly profile selection, or to display button functionality without activating.

The X52 Pro will ship in January 2007 and retails for US$199.95. It is another option in the crowded joystick market, but one that looks quite unique. Check **www.saitek.com** for latest information and availability.

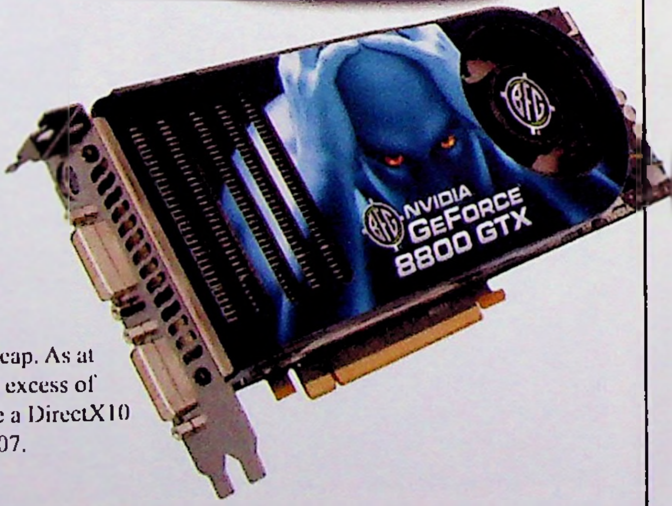
nVidia Ships DirectX10 compatible GPU

VIDEO chip/card manufacturer, nVidia, are now shipping the first of the DirectX10 capable GPU's to hit the market…

"Redefine your gaming reality with NVIDIA® SLI™-Ready GeForce® 8800 graphics processing units (GPUs). The world's first DirectX® 10 GPUs feature a powerful unified architecture that delivers an incredibly true-to-life gaming experience. Power through games at record speeds. Charge through game maps with vividly realistic, sun-up to sun-down HDR lighting effects while steering clear of mind-blowing physics effects such as explosions, fire, and smoke. Crank up 16x full-screen anti-aliasing without missing a beat – no jaggies, no worries. And when you're not pwning the enemy, relax to your favorite movies on HD DVD or Blu-ray™ disk with NVIDIA PureVideo™ HD technology.

Available Models: GeForce 8800 GTX and GeForce 8800 GTS

	GeForce 8800 GTX	GeForce 8800 GTS
Stream Processors	128	96
Core Clock (MHz)	575	500
Shader Clock (MHz)	1350	1200
Memory Clock (MHz)	900	800
Memory Amount	768MB	640MB
Memory Interface	384-bit	320-bit
Memory Bandwidth (GB/sec)	86.4	64
Texture Fill Rate (billion/sec)	36.8	24



The specs certainly look impressive, but be warned, new technology doesn't come cheap. As at time of writing, the street price for these new line of graphics processors/cards was in excess of US$450 for the basic models. Regardless, prices will eventually fall, and there will be a DirectX10 graphic option available at an affordable price for FSX users perhaps by March of 2007. Check out **www.nvidia.com** for the latest information.

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Strategic File Placement Gives You Complete Control Over Which Files And Programs You Want Increased Performance From

Accelerate the performance of your favorite games, simulations and applications.

Place Directories In The Optimum Position For Superior Performance!

Another significant cause of reduced and sluggish performance is the scattering of directories/folders all over your hard drive in no particular order. It's as big a cause of reduced performance as fragmentation. UltimateDefrag takes all of your directories and puts them together and in the best position possible for accelerated performance.

Enjoy fast 3 to 5 minute complete defrags!

With all the unused data placed out of the way of the data you use, it more or less stays out of the way of the defrag process. As a result, maintenance defrags finish fast. Usually - just a few minutes!

Choose From 4 Powerful Defrag Methods With Over 33 Defrag Option Combinations

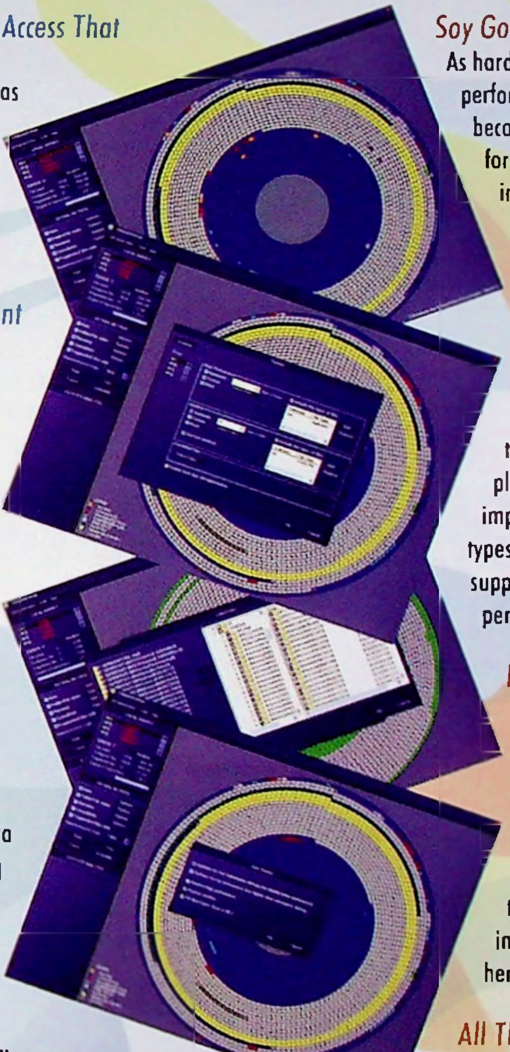
As much power and flexibility as you could ever ask for. Choose folders, file types, days since last use. Just select your parameters and let UltimateDefrag do its thing now and in the future.

Make Full Drives Perform Almost Like They've Been Newly Formatted

The net performance effect that UltimateDefrag gives you is the performance of a hard drive that's been freshly formatted. Faster actually due to the strategic file placement features it adds. Remember that new PC or that freshly formatted drive when your system responded instantly? You've got that back again.

The First Complete "DISK" Metaphor In Any Defragger

It took some programming but now for the first time, you get to see the true picture of your drive. Hard drives are round and files exist on these circular platters. Now you can see exactly where on your drives your files are. Much better than the square and rectangular representations of the past.



Say Goodbye To "Hard Drive Fatigue" Forever!

As hard drives become full and files scattered and fragmented, performance drags and becomes sluggish. Your hard drive becomes "fatigued". UltimateDefrag is like a pep-pill for your hard drive. You'll see the performance increase instantly!

More Than Just A Defragger - It's Also a File Placement Optimizer

Defraggers defrag. UltimateDefrag defrags.... it also optimizes! We find it hard to fathom that over the years the performance issue that was preached was "file fragmentation". File fragmentation is only part of the performance issue. The more important issue is file placement. UltimateDefrag defrags and does the more important thing - lets you strategically place files, file types, applications, folders and directories where they are supposed to be and in the appropriate order for optimum performance.

Defragging Defrags Your Files - UltimateDefrag Defrags Your File System

Regular defragging defrags files. UltimateDefrag looks beyond individual files and defrags and optimizes your file system and drive as a whole. It looks at the bigger picture of your drive. Where files exist on your hard drive, the order in which they exist, the relative position of where they exist are all far more important to performance than a few fragmented files here or there.

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Sydney to Honolulu... Cessna Style!

BY DR JOHN LATTANZIO

A former Prime Minister of Australia once said that the country was very centrally located - because it's a 24 hour flight from everywhere. That's a particularly Euro-centric view, however. It ignores the existence of the not insubstantial continent of Asia as well as New Zealand and the many Pacific islands. We Australians are used to squeezing ourselves onto one of Mr Boeing's 747s, and then emerging some 20 hours later, dehydrated, exhausted and not in the best of moods. Or if heading East to America we get to emerge in "only" 15 hours on the West Coast of the continent. It all got me thinking of the old days when a trip across the Pacific took days. I wondered if it could be done in a humble Cessna, hopping from island to island. Well, it actually is possible to get to Honolulu but from there to the American continent is impossible due to the lack of islands. But it gave me the idea for today's adventure - Sydney to Honolulu in a Cessna 172!

To make this trip in FS2004 I think we will need 10 legs, as shown in Figure 1. At least, that is my reading of the flight planner. You can also fly it in FSX too!

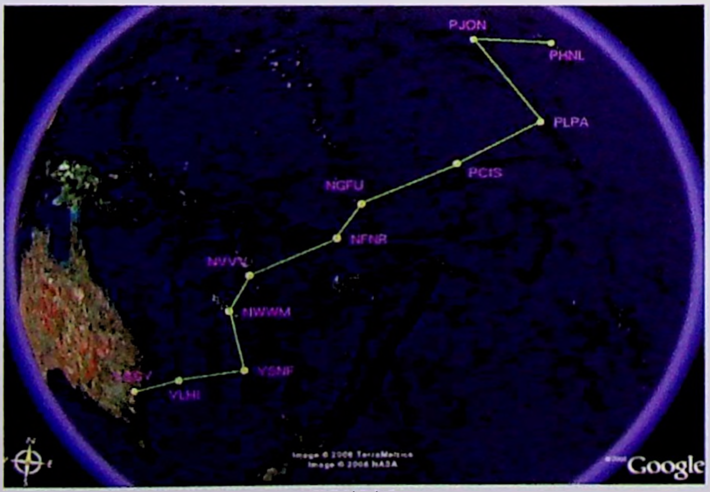


FIGURE 1

Clearly we can only use islands that exist in the FS2004 world. I think these are the shortest legs to get us all the way to Honolulu, given about 600 nm as the max range for a Cessna 172:

1 - YSSY to YLHI Lord Howe Island	**(424 nm)**
2 - YLHI to YSNF Norfolk Island	**(482 nm)**
3 - YSNF to NWWM Noumea	**(415 nm)**
4 - NWWM to NVVV Port Vila	**(293 nm)**
5 - NVVV to NFNR Rotuma	**(595 nm)**
6 - NFNR to NGFU Funafuti	**(268 nm)**
7 - NGFU to PCIS Canton Airfield	**(643 nm)**
8 - PCIS to PLPA Palmyra Island	**(776 nm)**
9 - PLPA to PJON Johnston Atoll	**(784 nm)**
10 - PJON to PHNL Honolulu	**(714 nm)**

You can get info about most of the airports from http://www.fallingrain.com/icao/ABCD.html where "ABCD" is the ICAO code, or from http://worldaerodata.com/

My approach to this is to be as realistic as I can be. So I will be using real weather, and making one leg per day. If the weather is really bad, of course, I may stay put for a day or so. If you have ActiveSky you will do better, as it has more weather stations across the Pacific Ocean.

My reading of the maps in FS2004 shows me no route where all legs are under 600 nm, which is the maximum range of our Cessna. The earlier legs are fine, but the last few get over 700 nm, and almost up to 800.

So I decided to install some virtual fuel tanks in the Cessna. I pretended that the backseat was turned into a reserve tank, weighing 32 pounds itself and capable of holding 180 pounds of fuel. Add to that my weight of 200 pounds, a front seat of sandwiches, coffee, toilet bucket (!) and assorted stuff weighing in at 60 pounds, and another 110 pounds in the baggage compartment, comprising life raft, basic survival kit, shark repellant, flares etc... Better to be prepared!

Now we are smack on the maximum weight for our Cessna 172 of 2550 pounds. Now, when we need extra fuel we pause the sim, change the weight in the backseat from 212 pounds to 32 and then add 180 pounds to our fuel. Mass is conserved, and this simulates a transfer of fuel from the reserve tanks.

When flying remember to allow for the gyro drift during the trip or your GPS will take you off course! And also don't forget to dial in the barometric pressure for the destination as you approach. Some of these fields are unattended and it's up to you to get the barometer reading before you leave. Hopefully it will not change too much while we are enroute.

Next, there is the question of which Cessna to take. Rather than use the default Cessna 172 I chose one from www.realairsimulations.com. Go to the downloads section and you will see a Cessna 172 commissioned by the Melbourne-based Kangan Batman TAFE (Technical and Further Education) Institute. No, it's nothing to do with that Batman, this is named after John Batman, one of the founders of Melbourne. This custom-built flight model has custom sounds and is used at the TAFE for flight training. It's better than the default, so we will use it. And it's free!

For continuity, I recommend that after you land and taxi to parking, you shut down the engine and save the flight. Then you can restart from that flight for the next leg. Picking up the plane from the spot you left it will add to the realism.

So with most of our preparations done, the last thing is a little theory! Just how do we squeeze the maximum endurance out of our piston engine? I will just give a brief summary here. There are many, many sources of info on this topic, since it forms a key part of pilot training. Useful web references are Ray Preston's pages - http://selair.selkirk.bc.ca/aerodynamics1/ - and for a more technical version you may wish to look at http://www.professionalpilot.ca/aerodynamics/performance/range_prop.htm which includes a great simulation. Look also at Prof David Rogers technical flying pages at http://web.usna.navy.mil/~dfr/rogers.html

The key to all this is the plot of drag versus velocity. Drag is closely related to the fuel flow, so in Figure 2 I plot a schematic showing the fuel flow at a given velocity for a Cessna 172.

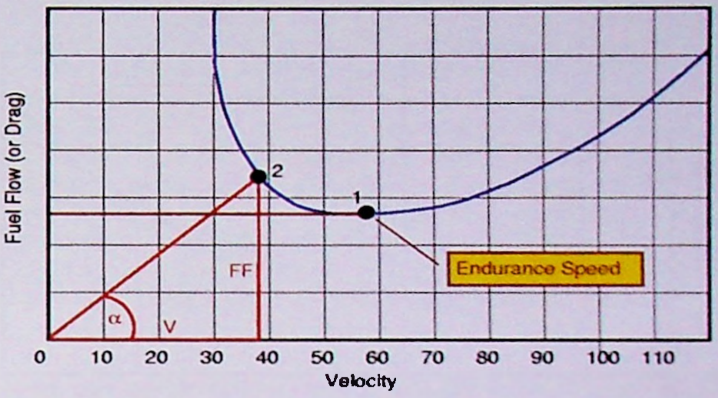


FIGURE 2

The lowest rate of fuel flow is at point 1, which will thus give us the longest time in the air, or the "maximum endurance". But this doesn't necessarily give us the maximum range.

Consider point 2. Draw a triangle to point 2 (as shown in red). The angle of this triangle is alpha, and tan(alpha) = FF/V where FF is the fuel flow at point 2 and V is the corresponding velocity. A little thought will show that FF/V is actually the inverse of the range. Consider the units: if fuel flow is in pounds per hour, and if we divide that by miles per hour we get pounds per mile. So tan(alpha) tells us the rate of fuel consumption per mile. We want this to be the lowest possible value to get the maximum range. Since tan(alpha) decreases with alpha, we want the smallest value for alpha. So at what point on the blue curve is alpha the smallest? That is shown by point 3 in Figure 3.

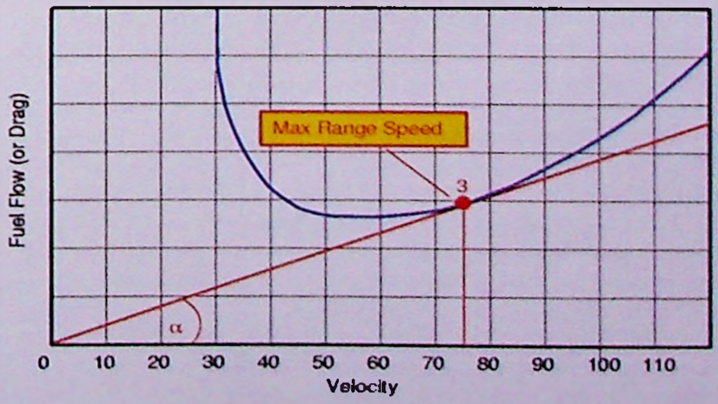


FIGURE 3

This tangent to the blue curve gives us the speed we should fly at to get the maximum range from a given amount of fuel. Note however that the blue curve is so flat in the region of Point 3 that you can in fact fly a little faster with no substantial penalty. So although the theoretical maximum range may be at about 75 KIAS you can, in practice, go to 85 or 90 with only a tiny penalty.

But what if there is some wind? If there is a headwind then it may be smarter to fly a little faster, to minimize our time in the air, with the wind working against us. Conversely, if we have a tailwind then we should slow down a little to take maximum advantage of the benefit of the wind. In these cases we have to start our triangle not at zero velocity but at the value corresponding to the wind. If we have a 30 knot headwind then we get the case shown in purple (Point 4) in Figure 4.

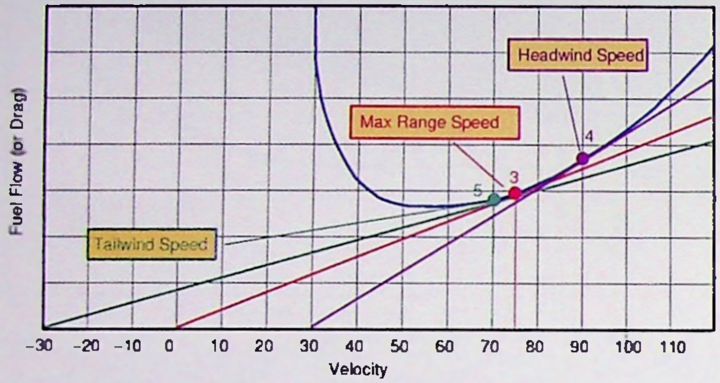


FIGURE 4

We should now fly at about 90 KIAS to reach the maximum range. If it was a 30 knot tailwind then we get the green case (Point 5). We slow down to receive the maximum effect from the tailwind. A common rule of thumb is to slow down, or speed up, by half of the magnitude of the wind. So in our case we would speed up or slow down by 15 KIAS corresponding to the 30 knot winds used in the figures (note that the curves are schematic and not particularly accurate). But, in fact, as Prof Rogers points out, using about one quarter of the wind speed is a more accurate solution. This is called the "one quarter rule of thumb".

What about altitude? Well, for a piston engine, like we have in the Cessna, it's not important. The range does not depend on the altitude, except through the effect of tail or headwinds aloft. See above references for more details if you want them. Oh, and it is of course assumed that you have the fuel mixture leaned properly at all times!

Enough theory. Let's take our modified Cessna and get going. The first leg is not so bad, an estimated 3:10 according to the FS2004 flight planner to cover a mere 424 nautical miles from Sydney (YSSY) to Lord Howe Island (YLHI). Well, I will take a little longer than that because I will be going slower to try to get better fuel economy. That's not strictly needed for this leg, as it's well within the range of our Cessna, even without the extra tanks. But I will load the tanks as well - in keeping with doing this as realistically as possible. I don't want to be caught with a serious headwind and be cursing the decision not to fill the tank in the backseat! The weather reports for YSSY and YLHI were not bad:

YSSY
Wind: 110 True, 8 Kts
Clouds: 3000 Broken, 3800 Broken
Precip: None
Temp: 17C Dew: 10C
Pressure: 1019.00 mb, 30.10 inches

YLHI
Wind: 000 True, 10 Kts
Clouds: None
Precip: None
Temp: 22C Dew: 17C
Pressure: 1018.00 mb, 30.07 inches

Our direct heading will be 59 degrees according to the GPS, so we expect mostly a cross-wind. As we pointed out earlier, there is no need for altitude so let's cruise at a lowly 3000 feet so we can see those whales and dolphins. I climbed into the RealAir Cessna VH-KBT in Sydney just after 9:00 on the first day, and we were airborne by 9:26. After a sight-seeing trip over Sydney downtown and the beautiful harbor I turned east and headed out over the ocean and toward Lord Howe Island.

I slowed to 100 KIAS to extend our range, and set the auto-pilot to follow the GPS. Nothing to do now but sit back and relax. Well, to make it interesting you could set a chance of failures or use *FSPassengers* to add that sense of the unknown. Then your relaxation can never be complete, as you will have to be looking for signs of trouble all the way. Nowhere to stop for an emergency out here...

After nearly 4 hours Lord Howe Island came into view. The sky had indeed cleared, as the *(ActiveSky)* weather forecast had predicted. I set the barometer pressure to the correct value for YLHI and landed at 13:44 Sydney time, some 4:08 since takeoff. Left and right tanks contained 56 pounds of fuel each, so we burned a total of 206 pounds in that 4 hour trip.

Lord Howe Island has been on the World Heritage list since 1982 because of its rare collection of plants, birds, marine life and exceptional natural beauty. It's about 7 million years old, resulting from a volcanic eruption, and is a lovely place to spend a few days. Qantaslink, the regional arm of Qantas, have regularly scheduled flights in Dash-8 aircraft.

After some days in the surf and sun, let's get on with our virtual trip. The next leg takes us to Norfolk Island, YSNF. Distance is 482 nm and an estimated trip duration of 3:35, according to the flight planner in FS2004. Well, we will again go slower to try to practice maximizing our endurance, so we will expect over 4 hours for our flight. After sleeping in, I loaded the Cessna and we were airborne at 10:39 local time. The weather reports show quite variable wind enroute, swinging from 090 at 10 (over YLHI) to 230 at 13 on arrival at YSNF:

YLHI
Wind: 090 True, 10 Kts, clouds: None

YSNF
Wind: 230 True, 13 Kts, clouds: 3500 Broken

We will be following the GPS on a heading of 060 so we can initially expect some significant headwinds on this trip. Better revise upwards our estimated time aloft of 4 hours. In fact, it took me 5:09 to make the trip, arriving with only 42 pounds of fuel in each tank. Thus we burned a total of 232 pounds on this leg.

Norfolk Island was discovered by Captain James Cook in 1774, and is another of the many beautiful islands in the Pacific. So let's stop here for a few days before continuing.

Our third leg takes us to the French territory of New Caledonia. We will be landing at Noumea's Magenta airport, NWWM. Noumea is the capital city with a population of about 90,000. It's some 293 nm from Norfolk Island at a heading of 008. Weather report says YSNF has winds 130 at 8 Kts, clouds: 3700 Few, 4600 Broken. The Magenta report says winds 140 at 18, few clouds at 3000 and broken clouds at 5000. So we should have a slight tailwind for this flight. Departure was at 9:06 local time and after an uneventful 4:13 I arrived at Magenta with 70 pounds in each tank. Total fuel used is thus only 179 pounds, thanks to that tailwind.

For the next flight we have a 3 hour trip to Vanuatu, planning on landing at Port Vila Bauerfield (NVVV) airport. The distance is only 292 nm, the second shortest of our ten planned legs. Check the weather, but we are not going to have any fuel problems on this short trip. I departed at 9:43 with all tanks full, as is our standard operating procedure for this trip. Note that we have to climb to about 6000 feet to clear the ridges near NWWM before heading at 008 to Vanuatu. Some 3 hours later we are coming in to land. I was assigned a visual to Runway 11 but there is also a localizer (offset from the runway, note!). Total time for this leg was a mere 3:02 and only 160 pounds of fuel used.

Our fifth leg starts to see us heading away from civilization! Today we will fly 595nm to the 43 square kilometer island of Rotuma (NFNR) in Fiji. Thank God for the GPS - finding this tiny island would be pretty tough otherwise! Now, this distance is near the max range for the Cessna, with no winds or extra tanks. So we will fill the spare tanks, but let's try not to use them unless we really need them. The weather is not promising:

NVVV
Wind: 090 at 11 Kts, clouds are broken at 2000.

NFNR
Wind: 070 at 3 Kts with clouds: 1900 Scattered and 31000 Broken.

We will be flying at a heading of 047 so we can expect a slight headwind. Departure was at 9:49 local time. I then climbed over the ridges and hills near the airport. It's in hilly terrain like this that *ActiveSky* can really add to the flying experience - watch the turbulence when trying to climb in this fully loaded aircraft! Anyway, once on our way I reduced the throttle to 90 KIAS to maximize our range. Maybe I should be flying faster, to minimize our time in the headwind, as discussed above? But it's not a severe headwind here so it probably does not matter so much.

Everything is going fine until I notice that the sky is getting dark. Whoops. My leisurely departures are fine for shorter trips. But for a long trip, and at low speed to extend range, we are likely to arrive in the dark! But this is not a major airport. We might be trying to land in the dark with minimal lights...

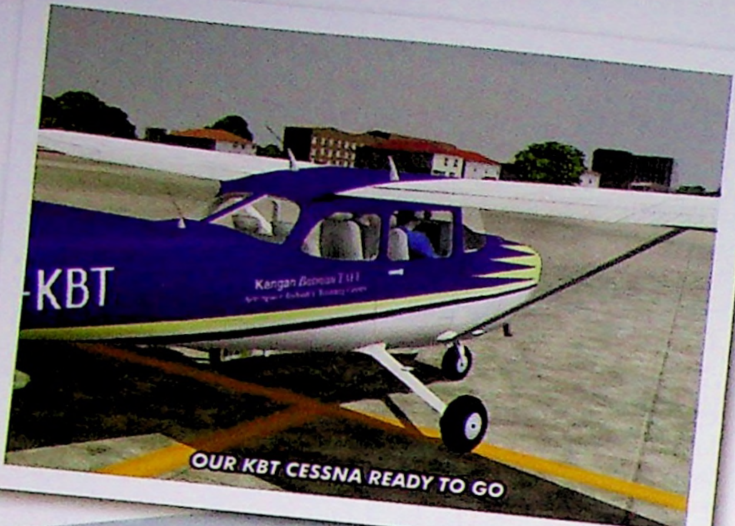
Indeed, this is how it is. I arrive after some 7 hours and indeed it's very dark and there are no lights at NFNR, at least in FS2004. The fuel gauges are reading zero! I am ready to switch to the extra tanks if needed. But I am distracted by trying to find the runway in the dark. It seems to me, on final approach, that I might be a bit low. Suddenly an autogen tree looms up at me in the darkness. A rapid swerve and full power gets me past this obstacle. Finally, I touch down in the dark after 7 hours and 23 minutes of flying. There are 10 pounds of fuel left in each tank, so we were sailing pretty close to the wind there! Total fuel used was 301 pounds. I am very pleased to have made it down safely.

Our next leg is a rather short hop of only 268 nm so it should take under 3 hours. Unfortunately the weather has turned nasty and we have thunderstorms forecast all the way from Rotuma to our destination of Funafuti (NGFU), in Tuvalu. Worse still, we have winds from 100 at 62kt! Well, no sane person would fly in this weather but this is a simulator so let's be brave. We will have a headwind and a serious crosswind for the flight, so I will fly at high speed to try to get it all over quickly.

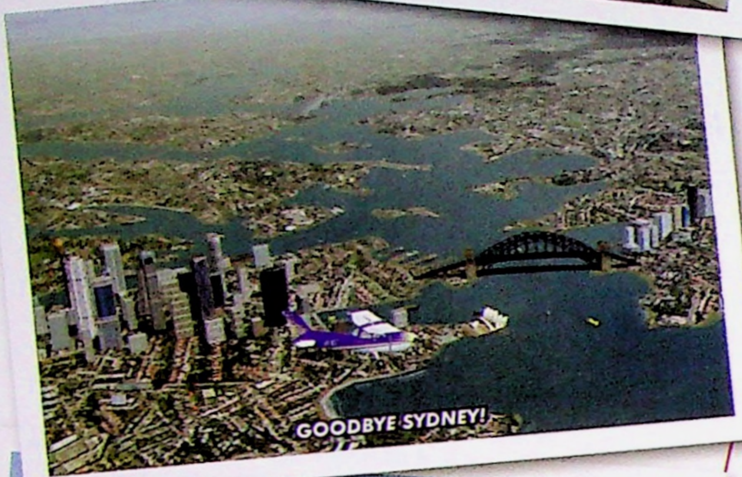
Departure was at 10:43 and there were serious gusts of wind making it hard to even steer the plane along the taxiway. This was the shortest takeoff roll I have ever done. With the wind providing 60 knots the Cessna almost went straight up on the spot! With 110 KIAS I was getting only 52 knots ground speed. Anyway, into the storms and head for Tuvalu. I chose the NDB approach to Runway 03 which is not ideal when the wind is 60 knots from 100, but there was no other choice. It was either 03 or 21 so there was no joy to be had either way. Flying down the runway with a crab angle of about 45 degrees and almost no groundspeed is quite a thrill. I arrived after a flight of 2:42 and we used 152 pounds of fuel.

Tuvalu is a very interesting place, in fact. It has a population of 12,000 making it the fourth smallest country in the world. These folk are scattered over 9 atolls with a total surface area of only 27 square kilometers. The largest source of income for this nation is its internet domain name... yes, it is the owner of the .tv domain names and it has been quite entrepreneurial in leasing these to people who will pay for them, to the tune of several millions of dollars per year.

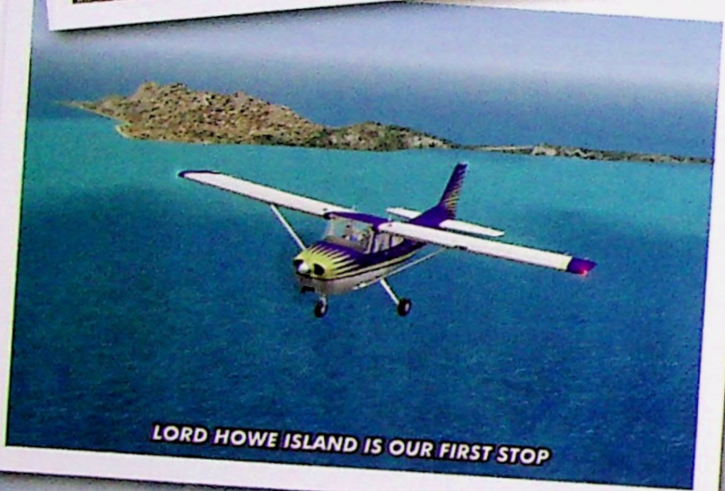
After a day or two exploring the islands, I head off to the next stop on our journey. Now we have nothing but long distance trips left. The next is some 643 nm to Canton Airfield, PCIS, in the Republic of Kiribati. This is a group of some 33 atolls, including Tarawa Atoll which was occupied by Japan during WWII. The Battle of Tarawa took place in Kiribati's capital, Bairiki, on Tarawa Atoll. But enough of this. Let's load up and get going. Full fuel, and don't forget the reserve tanks. We may need them depending on the wind.



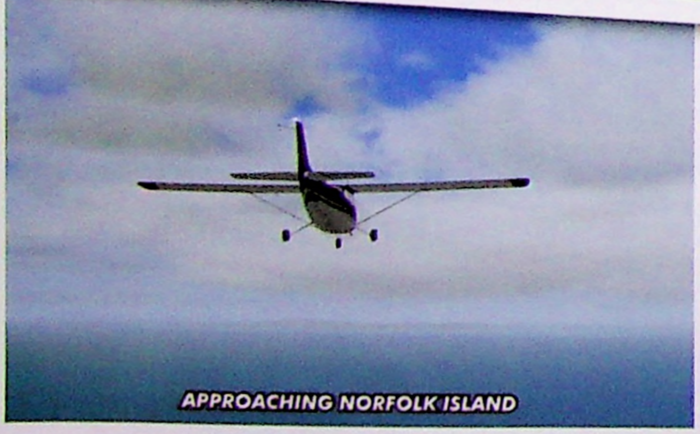
OUR KBT CESSNA READY TO GO



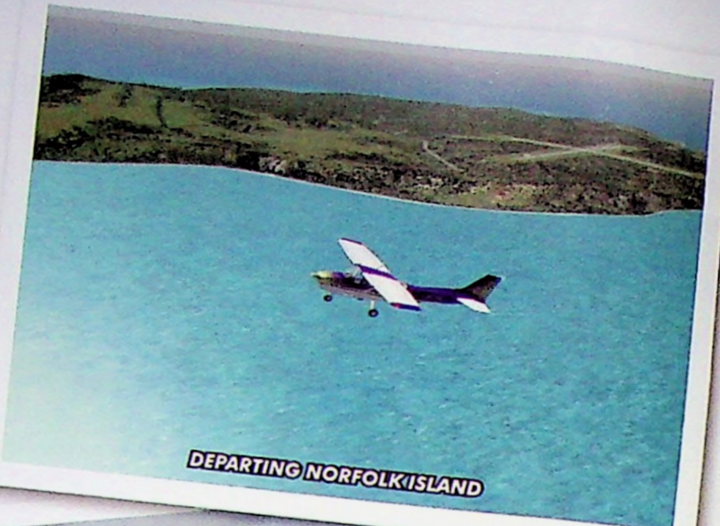
GOODBYE SYDNEY!



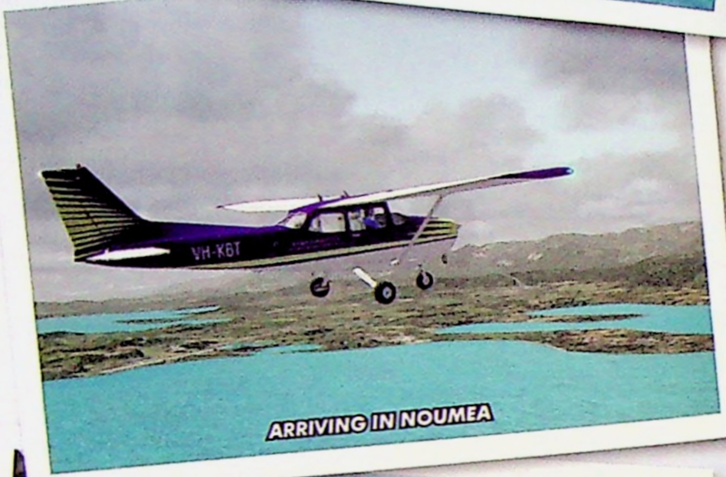
LORD HOWE ISLAND IS OUR FIRST STOP



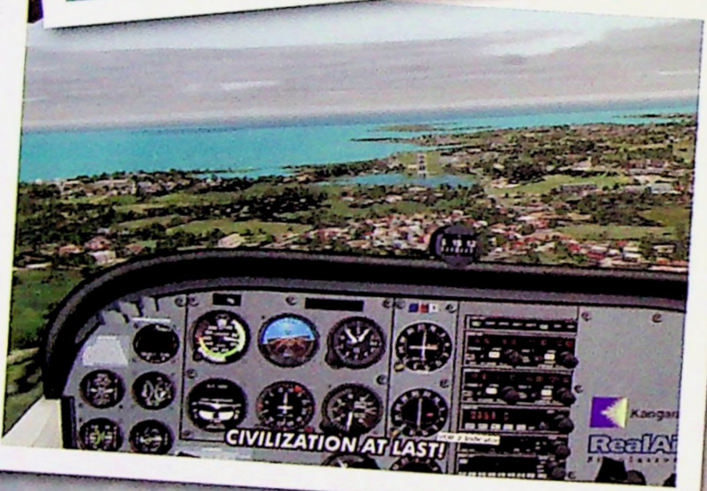
APPROACHING NORFOLK ISLAND



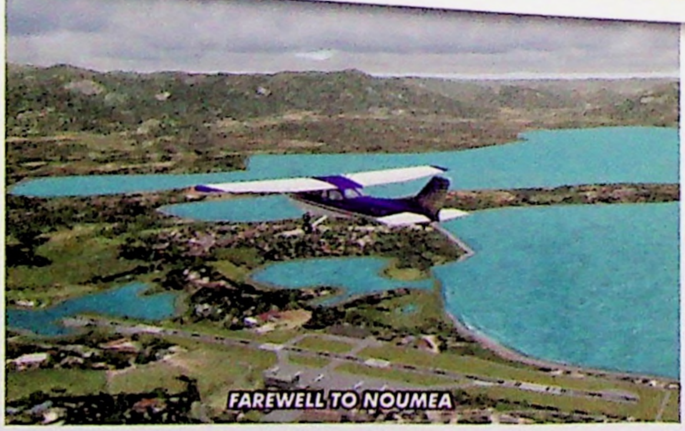
DEPARTING NORFOLK ISLAND



ARRIVING IN NOUMEA

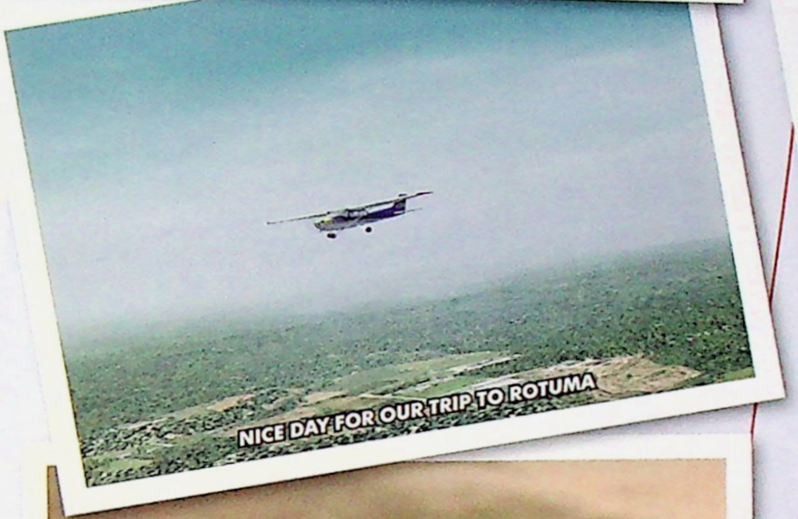


CIVILIZATION AT LAST!

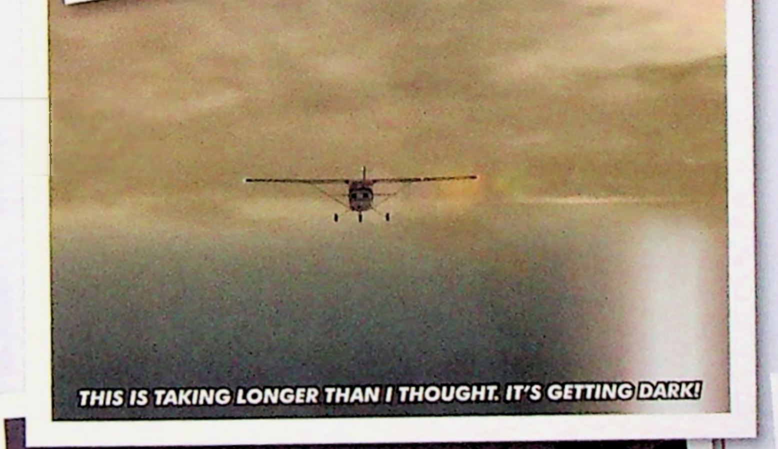


FAREWELL TO NOUMEA

TOUCHDOWN IN PORT VILA



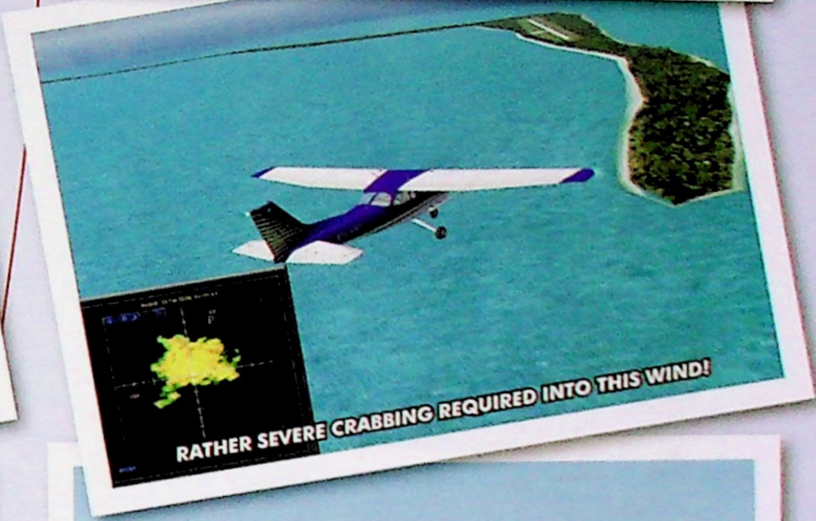
NICE DAY FOR OUR TRIP TO ROTUMA



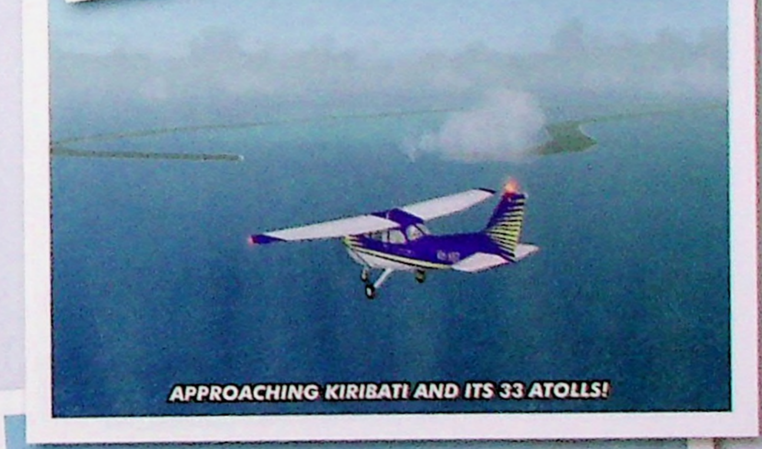
THIS IS TAKING LONGER THAN I THOUGHT. IT'S GETTING DARK!

RISKY LANDING WITH NO LIGHTS IN ROTUMA

RAIN AND STORMS ENROUTE TO FUNAFUTI

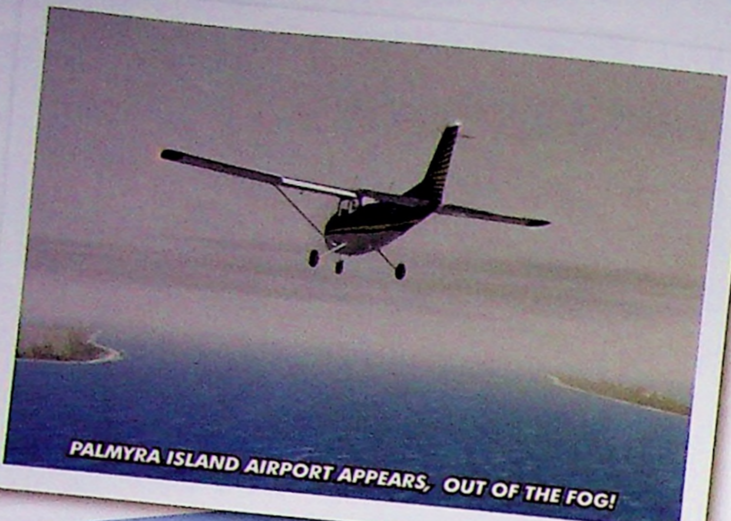


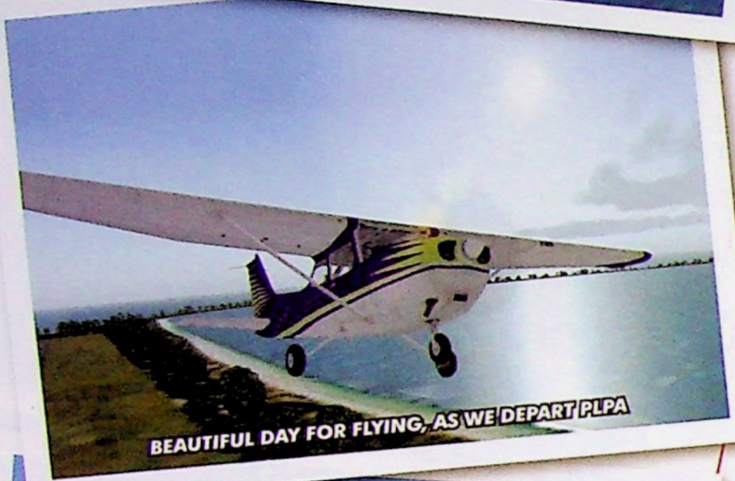
RATHER SEVERE CRABBING REQUIRED INTO THIS WIND!

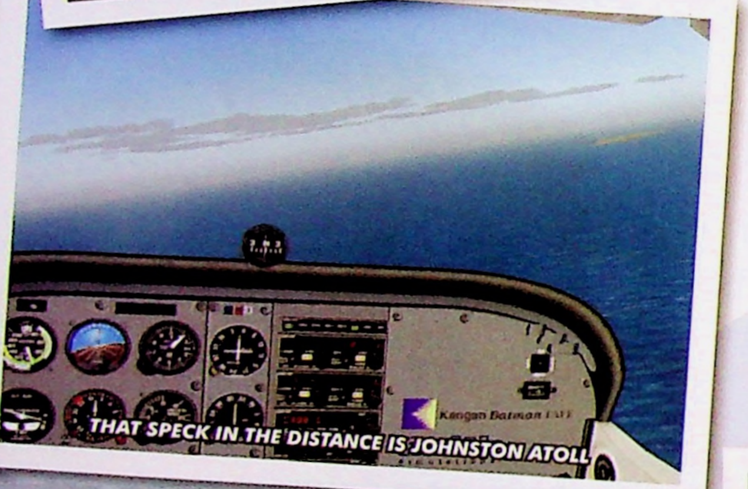


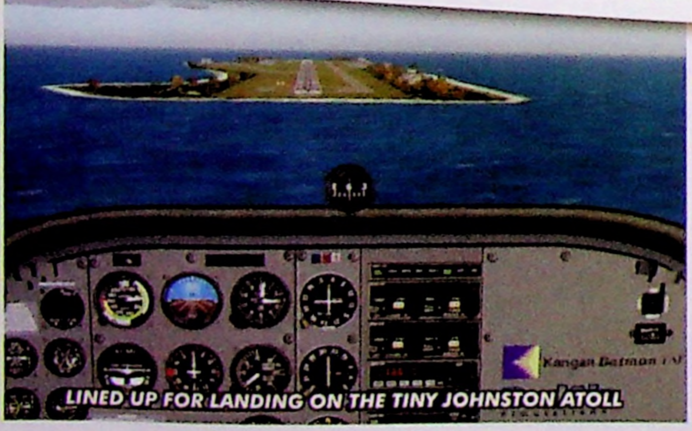
APPROACHING KIRIBATI AND ITS 33 ATOLLS!

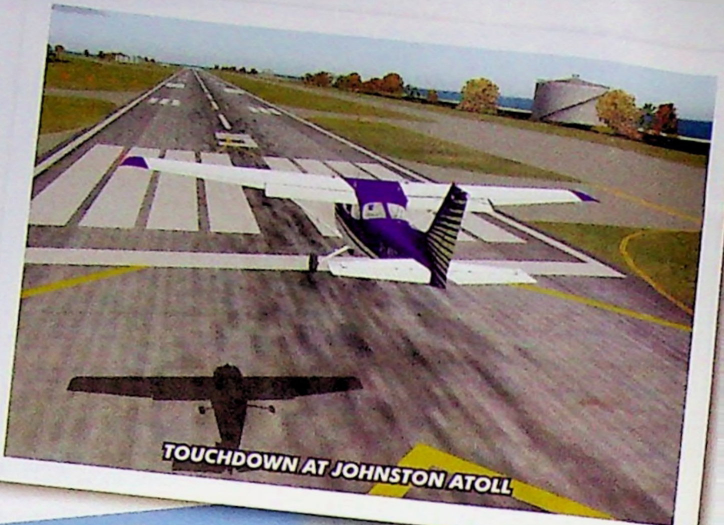
FINAL APPROACH FOR CANTON AIRFIELD

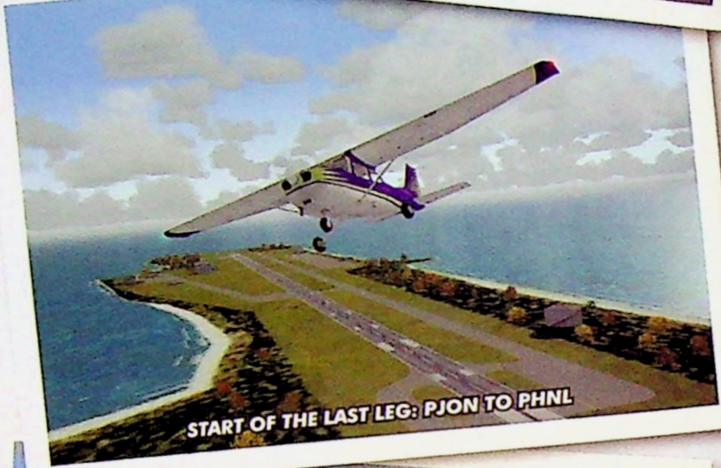

PALMYRA ISLAND AIRPORT APPEARS, OUT OF THE FOG!

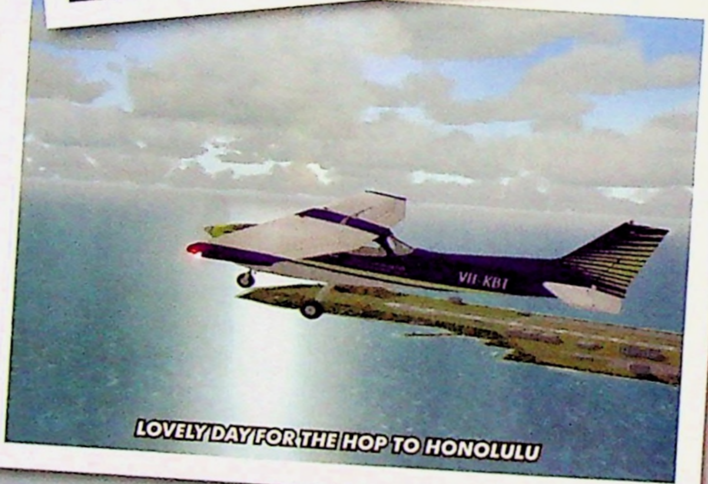

BEAUTIFUL DAY FOR FLYING, AS WE DEPART PLPA

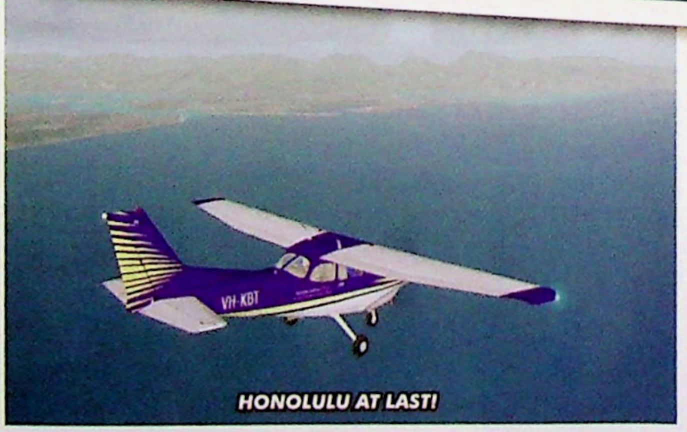

THAT SPECK IN THE DISTANCE IS JOHNSTON ATOLL


LINED UP FOR LANDING ON THE TINY JOHNSTON ATOLL


TOUCHDOWN AT JOHNSTON ATOLL


START OF THE LAST LEG: PJON TO PHNL


LOVELY DAY FOR THE HOP TO HONOLULU


HONOLULU AT LAST!

ITS A BIT FOGGY, BUT WE ARE HERE AT LAST

FINAL TOUCHDOWN IN HONOLULU

A check with *ActiveSky* shows NGFU weather as 08010KT 45KM SCT019TCU BKN110 29/26 Q1008. Since we are flying a heading of 046 we will indeed have a headwind. We may want to maximize our range by using the "one quarter rule of thumb" discussed earlier. We saw that our best range comes at a speed of about 75 KIAS but that there was negligible penalty for increasing this to 85 or 90. Our headwind is actually quite small - about 10kts so the one-quarter rule would have us adding about 10/4 = 2.5 knots. So a speed of 90 should be about optimal. Let's not make the mistake we made earlier, by arriving in the dark at an unknown airport! I suggest we get going nice and early... at 6:30 am.

And so I did, arriving after an uneventful trip some 9 hours and 44 minutes later. Fuel? Not a problem at all! We had an entire 11 pounds left in the tanks! That is, 5.5lb per tank. We used 310 lbs on this long trip. And the last three are even longer. For these we are bound to need our reserve tanks.

Leg number 8 takes us the 776 nm from Canton airfield to Palmyra Airport (PLPA), an unattended airport on Palmyra Atoll. This tiny atoll is administered by the US, and has a total area of 12 square km. There is no indigenous population on the atoll, and it is privately owned by The Nature Conservancy and managed as a nature reserve. It is manned by scientists and volunteers only, typically under 20 at any time. There are some roads left from WWII, and an unpaved 2000m airstrip which is our destination for today!

The weather indicates a slight tailwind so we will slow a little to take advantage of it. Remember the "one-quarter rule of thumb". Let's depart early because of the long flight and slower air-speed. I left at 6:31 in light rain and substantial fog. This is not what the Pacific Islands are supposed to be like! Anyway, with 140 nm to PLPA I was down to 17 pounds of fuel. Time to transfer from the reserve tanks. Pause the sim, change your payload down from 106 pounds per passenger in the rear seats to 16 per passenger (the weight of the tank) and then add 90 pounds of fuel to the left and right tanks. This simulates the transfer of the fuel from the reserve tank to the normal tanks.

If you are using *FSPassengers*, for that nice random touch and the requirement to maintain your plane, then you will not be allowed to do this. Well, you can, but it will end the FSP flight. Your choice. You can make the rest of the flight without FSP.

Coming into Palmyra I found myself descending through clouds in hope of laying my eyes on the runway! After straining my eyes for a while, it eventually came into sight through the fog. Total time enroute was a huge 9 hours and 58 minutes, burning a total of 358 pounds of fuel.

The second last flight takes us to Johnston Atoll, PJON. This is a tiny coral island, 7 square kilometres in area, and an unincorporated territory of the US, who conducted a series of nuclear tests there in the 50s and 60s. It was also a chemical and biological weapons storage and incineration site. Lucky little island, no? Anyway, there are just a couple of hundred US military personnel there now, and hopefully they will allow us to land and refuel.

The weather indicates winds of about 5 or 6 knots which is pretty negligible, although they will be providing a slight tailwind. The rain has cleared and we have lovely sunny skies at last. I departed Palmyra Island at 7:33 local time. Some 37 miles from PJON I was down to 3 pounds of fuel. So close, and yet we are clearly not going to make it without using the reserve tanks. A little more tailwind and we would have done it! But, transfer fuel as per instructions above and continue the flight. Touchdown after 6 hours and 54 minutes, with a fuel burn of 325 pounds. Just 4 pounds into the reserves.

So we come to the last leg - from Johnston Atoll to Honolulu, some 714 nm away. The weather is again fine, with calm winds forecast in PHNL when we depart at 7:32 from PJON. Not far out from PJON we pick up a nice little tailwind of about 15 knots. I slowed down to about 85KIAS to maximize the effect. We just might make it all the way without needing the reserves, if we are lucky and skillful. Eventually Honolulu comes into sight and it seems that the fuel is holding. That tailwind means we should make it all the way without the need for the reserve tanks. Indeed, I make contact with PHNL after 8 hours and 59 minutes, with some 21 pounds of fuel left in the tanks! Well, I will definitely go and explore the Hawaiian Islands, but perhaps not today. At the very least, we should refuel first.

So overall our trip of ten legs took us over a distance of 5395 nm. We spent more than 62 hours getting a numb bum in the Cessna, and burned 2514 pounds of fuel. Interestingly, we only broke into the reserve tanks twice - once for only 4 pounds of fuel and the other time for 46 pounds. If one was patient, and waited for the right winds, I reckon we could go all the way from Sydney to Honolulu without reserve tanks. But it's a waiting game, requiring the correct wind conditions. Maybe you would like to try that? In the virtual world, there is no penalty for spending a few days on a tiny island waiting for the right winds!

But you know, the next time I crawl from one of Mr Boeing's big jets, I will think of this trip and although I may be grumpy and tired and dehydrated, I will thank the big bird for saving me at least 10 days compared to making the trip in a Cessna! ✈

Microsoft® Flight Simulator X

Tips and Tricks

BY DOUG HORTON

Here's an extended collection of hints for FSX, gathered from various sources, including my own trials and discoveries in "flying" the new Flight Simulator version. There are many new features, files, file locations, and keystrokes in FSX, and here are some hints based on these changes.

Configuration File Locations

Here are the principal FSX configuration files that are often modified, where they're located, and in what format they're provided.

Note that these files may be hidden by default on your system. If so, go to "My Computer", then the Tools menu > Folder Options > View tab, then look for an entry named "Show Hidden Files and Folders" and make sure that is checked.

FSX.cfg contains the main settings for FSX. It's located in the C:\Documents and Settings\(username)\Application Data\Microsoft\FSX\ folder. If your computer has multiple users, each with "username" subfolders in the \Documents and Settings\ folder, then each user can have their own settings. FSX.cfg is a text file, which can be modified through the in-sim Settings interface or manually with a text editor such as Notepad, Wordpad, or a word processor such as Word.

Scenery.cfg contains settings for both default and add-on scenery. It's located in the C:\Documents and Settings\All Users\Application Data\Microsoft\FSX\ folder. If your computer has multiple users, scenery library settings apply to all users – changes made by any user apply to all users. Scenery.cfg is a text file and it's modified by the scenery library interface, some add-on scenery installers, or manually with a text editor.

Standard.xml contains command settings for your keyboard and controllers (joystick, yoke, pedals, etc.). Curiously, this file exists in two locations with the same name, though the function in each location is different. The Standard.xml file that is located in the main (root) FSX folder contains a catalogue of settings (mappings) for a large number of popular game controllers. This file is similar in content but not format to the Devices.cfg file in the FS2004 main folder. I'll stress "similar in content" because the settings for my CH Products controllers in the (FSX)\Standard.xml file are different from the (FS2004)\Devices.cfg settings, and the settings for my controllers seem more appropriate in FS2004.

Another version is Standard.xml, contained in C:\Documents and Settings\(username)\Application Data\Microsoft\FSX\Controls\. This file contains customized settings for your installed game controllers, and it should be populated automatically with the settings for your controllers that are found in the version of Standard.xml described in the previous paragraph. In my case, with CH Flight Sim Yoke USB and CH Pro Pedals USB, the file did not pick up settings correctly, and additionally, I prefer the FS2004 settings. So, I used the controller Settings interface to set up my yoke and pedals axes and I changed some yoke buttons to my preference. Note for users of the popular CH Flight Sim Yoke USB: the FSX default settings do not include setting the button 5/6 lever for landing gear extend/retract as in FS2004, and it's not possible to make these assignments using the Settings interface. Instead, right-click to select Edit, then modify the following lines in the user version of the default.xml file, with assignments in bold blue.

```
  <SimControls.Map>
        <Name>CH FLIGHT SIM YOKE USB {AE32D400-A3AC-11DA-
8003-444553540000}</Name>

           (other lines)

        <Entry>
           <Index>4</Index>
           <Down>GEAR_UP</Down>
        </Entry>
        <Entry>
           <Index>5</Index>
           <Down>GEAR_DOWN</Down>
        </Entry>
         (other lines)
```

Note that the index numbers are one number lower than button numbers. Index numbers 4 and 5 apply to buttons 5 and 6, for example. To match your settings in FS2004, edit the user version of Standard.xml (after saving a copy before editing) to match index numbers and corresponding assignments with those in the FS2004 Devices.cfg file.

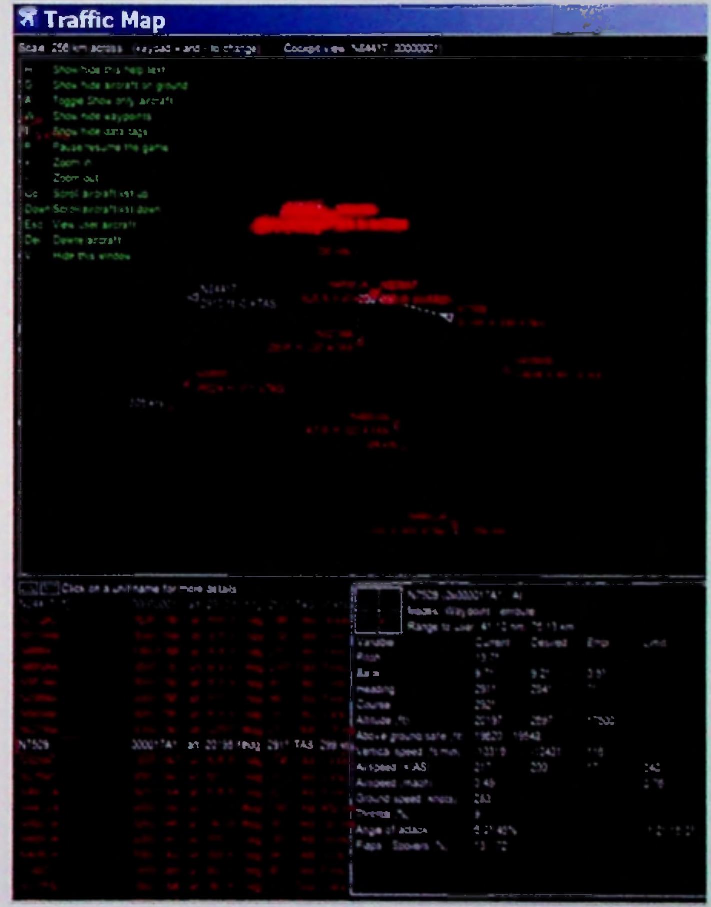
DLL.xml contains enabling settings for various *.dll files. It's located in the same folder as your FSX.cfg file – see above. Read the next topic for a sample modification of this file.

Traffic Toolbox

With the Deluxe version, you can add the Traffic Toolbox to your FSX installation and display it as desired. First, if you haven't already done so, you'll need to extract the FSX Software Development Kit (SDK) files to your hard drive from Disc 1 of the Deluxe version installation DVDs. You'll find the next step easier if you install the SDK subfolder into your FSX folder. Next, after saving a copy of the default file, right-click your DLL.xml file, select Edit, then find the section shown below:

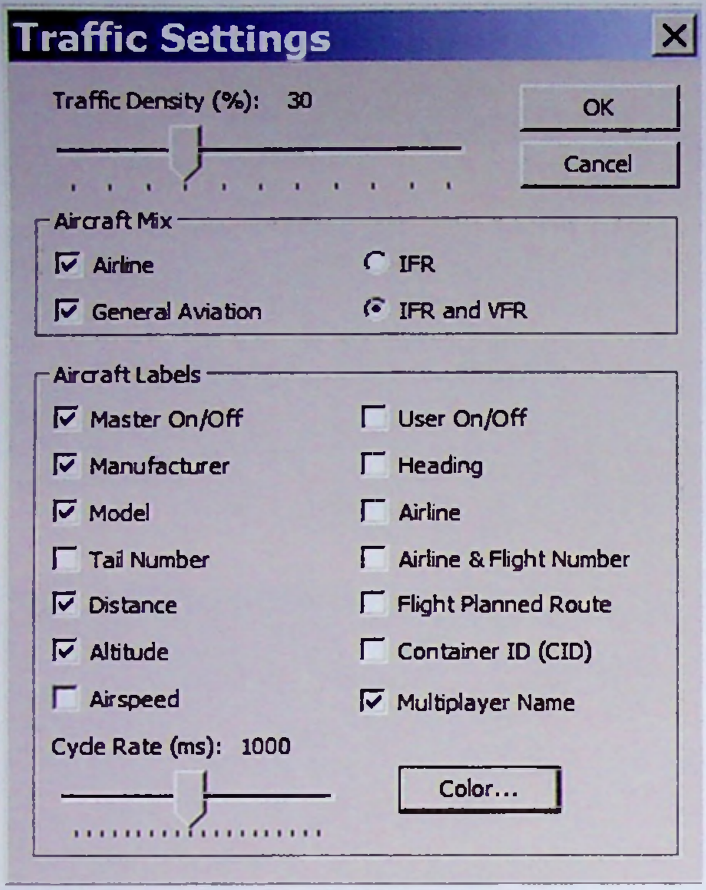
```
    <Launch.Addon>
       <Name>Traffic Toolbox</Name>
       <Disabled>True</Disabled>
       <ManualLoad>False</ManualLoad>
       <Path>..\Microsoft Flight Simulator X SDK\SDK\Environment Kit\
Traffic Toolbox SDK\traffictoolbox.dll</Path>
     </Launch.Addon>
```

Next, edit the line "<Disabled>True</Disabled>" to read "<Disabled>False</Disabled>", change the <Path> description to match where you've installed the SDK files, then save and close the DLL.xml file. When you next run FSX, a Tools column will be displayed on the menu bar, and under it you'll see several options for displaying components of Traffic Toolbox. Detailed instructions are contained in the SDK. The cluster of objects in the Traffic Map illustration results from aircraft at Chicago O'Hare, as I fly in a westerly direction southwest of O'Hare in aircraft tail number N8441T, in white type.



ADDING THE TRAFFIC TOOLBOX PROVIDES ADDITIONAL TOOLS FOR EXPLORING AI OBJECTS

In addition to displaying AI aircraft, Traffic Toolbox can display non-aircraft objects – for example, ships – as non-AI static scenery. After pressing A to toggle the display of non-aircraft objects, you can check if a particular ship is displayed. If it isn't displayed, it isn't an AI object, just a static scenery object. Another feature of the Traffic Toolbox is the Traffic Settings interface, which exposes settings for traffic labels that can otherwise only be accessed by editing your FSX.cfg file.



Traffic Settings

Traffic Density (%): 30

Aircraft Mix

☑ Airline
○ IFR
☑ General Aviation
● IFR and VFR

Aircraft Labels

☑ Master On/Off
☐ User On/Off
☑ Manufacturer
☐ Heading
☑ Model
☐ Airline
☐ Tail Number
☐ Airline & Flight Number
☑ Distance
☐ Flight Planned Route
☑ Altitude
☐ Container ID (CID)
☐ Airspeed
☑ Multiplayer Name

Cycle Rate (ms): 1000

THE TRAFFIC SETTINGS INTERFACE INCLUDES ADDITIONAL OPTIONS FOR AI AIRCRAFT TRAFFIC LABELS

Mission Rewards

When you fly missions, if you check the box that allows you to change realism settings, you will not earn any rewards for flying the mission, regardless of whether you satisfied the mission requirements or what reward is specified for the mission.

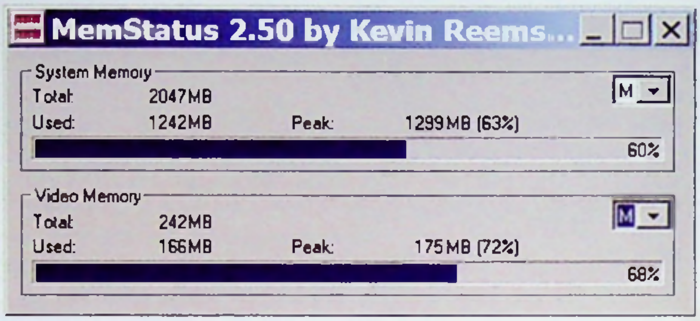
MISSION REWARDS ARE NOT EARNED IF YOU ALLOW CHANGES IN REALISM SETTINGS

Menu Toggle

To gain a slightly larger view, you can toggle the main FSX menu bar off in both window and full-screen modes by holding down the Alt key for about 2 seconds. To display the menu again, just tap the Alt key briefly.

Memory Status

Ever wonder how much main memory and video memory are being used while you run Flight Simulator and other applications? This may be more important with FSX than previous versions because of higher scenery and terrain demands. Try the free MemStatus program by Kevin Reems, which you can download from his website at **http://www.nuclearplayground.com/NuclearPlayground/MemStatus**



MemStatus 2.50 by Kevin Reems...

System Memory
Total: 2047MB
Used: 1242MB Peak: 1299MB (63%)
60%

Video Memory
Total: 242MB
Used: 166MB Peak: 175MB (72%)
68%

MEMSTATUS DISPLAYS CURRENT AND PEAK USE OF MAIN AND VIDEO MEMORY

MemStatus is a small application designed to track and display how much physical system and video memory you're using. And though there are many other programs that provide this display, MemStatus is easy to read and it also displays peak memory usages for the current session. MemStatus does not provide any service for freeing, managing, or defragmenting memory.

According to Kevin, total video memory is memory that is usable by applications. Depending on your video card and driver, this will probably be slightly less than the actual amount of onboard memory as some memory may be reserved for the screen display, cache, or buffers.

When I installed a new motherboard and CPU earlier this year, I installed 1 GB of system memory. That seemed like enough, but I soon discovered that my system was using virtual (hard drive) memory when running FS2004, and I added another GB of memory. The indicator in the accompanying screenshot shows peak memory use while running FSX of 1299 MB (1.299 GB), so my adding of a second GB of memory was necessary to avoid using virtual memory. On the other hand, the 256 MB memory on my video card appears to be quite sufficient, as the 72% usage shown is the highest I've seen with FSX and several other applications running.

Performance Tuning

Many FSX users are concerned with performance, particularly as related to frame rates. Microsoft's position on this subject is summarized in developer Paul Lange's blog at **http://blogs.technet.com/p-12c_pilot/default.aspx**, in the article titled "Performance Anxiety." Simply stated, FSX is designed to challenge current hardware, so that over the multiyear life of FSX, as hardware improves, users will realize the full potential of FSX. Of course, meanwhile, even those with high-end systems may not realize performance they consider acceptable.

Many tweaks have been discussed in various forum postings, and many of these have been collected by user Greg Germanowski in a 24-page document that is posted at **http://members.cox.net/spambait/FSXTweakGuide.pdf**. Greg will likely update this guide as new information is learned. Also, Microsoft's Hal Bryan is reportedly preparing an article on performance, hopefully with comprehensive, authoritative information, which should appear on **www.fsinsider.com**.

At the time of this writing, it's not completely clear what tweaks work best, though some users believe that reducing the number of autogen objects provides a significant improvement. As background, Microsoft indicates that the number of autogen objects is greater in FSX with the settings slider set at Sparse than in FS2004 at maximum. But the autogen slider setting in FSX to the left of Sparse is None, and to attain improved performance, users may wish to have fewer objects than the default number in Sparse but more than None.

To adjust the maximum number of autogen objects appearing, a suggested tweak is adding the following lines to the [Terrain] section of your FSX.cfg file:

```
TERRAIN_MAX_AUTOGEN_TREES_PER_CELL=4500
TERRAIN_MAX_AUTOGEN_BUILDINGS_PER_CELL=3000
```

The autogen slider will scale down from the numbers you set as the slider is moved to the left. The numbers shown are the default settings, and 6000 is the maximum that can be specified. Currently, I've reduced each to half of the default setting; namely, 2250 and 1500, and I'm running FSX with the autogen slider on Sparse, with apparent improvement in frame rate. I'm trying several other tweaks, though it's not clear which are most productive.

Adding Average Frame Rate Display

Because the standard display of frame rate is quite variable, results of adjusting FSX performance will be more easily analyzed by adding the optional average frame rate display.

As suggested by Jon Patch, you can add an average frame rate display to the information lines that are available in the upper left-hand corner of your FSX screen by cycling the Shift+Z keystroke. The format of this optional display is [(Minimum) (Average) (Maximum)] V: xx.x%. The number following the V: entry indicates percentage variation of the average. Cycling the information lines with Shift+Z appears to reset the numbers.

The parameters displayed by the on-screen text information lines are controlled by six sections of your FSX.cfg file: [TextInfo.1], [TextInfo.2], [TextInfo.3], [SlewTextInfo.1], [SlewTextInfo.2], and [SlewTextInfo.3]. To include the average frame rate display in your information text lines, it's easiest to add the required parameter to the end of each of the .2 and .3 information sections. These sections define the lines that are displayed with the second and third keypresses of Shift+Z in normal and slew modes). Add AverageFrameRate=x,y, then number the lines as shown in **bold blue** type. By the way, the first number at the end of each parameter line indicates the line number and the second number indicates the position in the line. If you prefer a different order of the information parameters, you'll need to re-number accordingly.

```
[TextInfo.2]
FrameRate=1,1
LockedFrameRate=1,2
GForce=1,3
FuelPercentage=1,4
AverageFrameRate=1,5
```

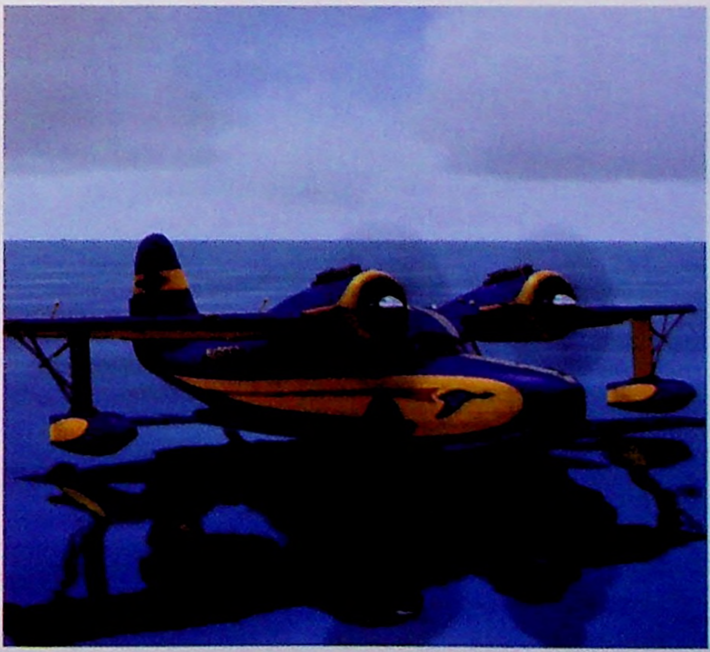
```
[SlewTextInfo.2]
FrameRate=1,1
LockedFrameRate=1,2
AverageFrameRate=1,3
```

```
[TextInfo.3]
Latitude=1,1
Longitude=1,2
Altitude=1,3
Heading=1,4
AirSpeed=1,5
WindDirectionAndSpeed=1,6
FrameRate=2,1
LockedFrameRate=2,2
GForce=2,3
FuelPercentage=2,4
AverageFrameRate=2,5
```

```
[SlewTextInfo.3]
Latitude=1,1
Longitude=1,2
Altitude=1,3
Heading=1,4
AirSpeed=1,5
FrameRate=2,1
LockedFrameRate=2,2
AverageFrameRate=2,3
```

Animation Commands

There are many new animations for FSX aircraft, including skis for two versions of the Maule Orion and wingtip floats for all versions of the Grumman Goose. The skis are operated with the customary G key, since they are related to landing gear. The Goose's wingtip floats are retracted for flying and ground landing, and they're extended for water landings and taxiing. There's a switch for this feature on a panel section for the Goose, but related keyboard commands are not preprogrammed. If you wish to program these keyboard commands, go to Settings, Controls, Buttons/Keys, and add keystrokes for the Floats (extend) and Floats (retract) commands.



GRUMMAN GOOSE WITH WINGTIP FLOATS EXTENDED ON WATER

GRUMMAN GOOSE WITH WINGTIP FLOATS RETRACTED ON LAND

Voices on USB Headset

How about listening to FSX voices (ATIS, ATC, mission, multiplayer, lessons, etc.) on a headset while engine and other non-voice sounds continue to play through your speakers? This is what real pilots experience, and it's easily done with FSX if you have a USB headset or a second sound card with a regular miniplug. Adding a USB headset seems easier and less expensive than adding a second sound card and a non-USB headset.

This feature works with a USB headset even if you have only one sound card in your system because Windows sees the USB headset as a second audio device and allows you to configure the outputs of the two audio devices separately, as follows:

1. Plug in your USB headset to a USB port.
2. Go to Start > Control Panel > Sounds and Audio Devices.
3. Click the "Audio" tab.
4. Ensure that both "sound playback" and "sound recording" are set to your primary audio card.
5. Click the "Voice" tab.
6. Set both the "sound playback" and "sound recording" to your USB headset, which should appear in the drop-down window list of devices.
7. Click "Apply" and "OK."

Start FSX and all voices should play through your headset while engine and other environmental sounds will be heard through your main speakers. If FSX is running while you change these settings, you'll have to restart it before the new settings take effect.

YOU CAN LISTEN TO FSX VOICES ON A USB HEADSET WHILE OTHER FSX SOUNDS PLAY THROUGH SPEAKERS

I've discovered also that it's possible to periodically unplug and plug in your USB headset after making these settings, and the Sounds and Audio Devices settings will adapt accordingly. If your headset is plugged in, you'll hear voices through it, and if you unplug the headset, voices will play through your speakers. Nice!

New Keystrokes

There are many new and revised keyboard commands. You can print the complete list of default commands by exploring your flight simulator folder, then look for kneeboard_keys.htm in the FSX\Uires subfolder. Here are highlights of a few new commands.

Pressing Spacebar in FS2004 returns cockpit views to front and center in normal views or True North in Slew mode. The corresponding keypress in FSX is Ctrl+Spacebar. Note that this feature can be used to calculate magnetic variation. In the default situation in the Trike over Friday Harbor, select Slew (keystroke Y) and press Ctrl+Spacebar. Press Shift+Z to display text information, then note the displayed heading of 342° magnetic. Since Magnetic + East Variation = True, the variation indicated by FSX is 18°E. Note that on the sectional chart it's shown as 20°E, so there may be a slight error in the FSX variation database, but it's close.

Pressing Shift+Enter and Shift+Backspace moves your eyepoint down and up in Virtual Cockpit view, as in FS2004, but these keystrokes are replaced in 2D cockpit view in FSX by Ctrl+Q and Ctrl+Shift+Q, which can be pressed repeatedly.

In Slew mode, to increase altitude slowly, press Q, as in FS2004, but to decrease altitude slowly, press Z, which replaces A in FS2004. Pressing Q or Z multiple times increases the rate of altitude change, and pressing the opposite key the same number of times (or pressing F2) stops the motion. ✈

A great start into the New Year:
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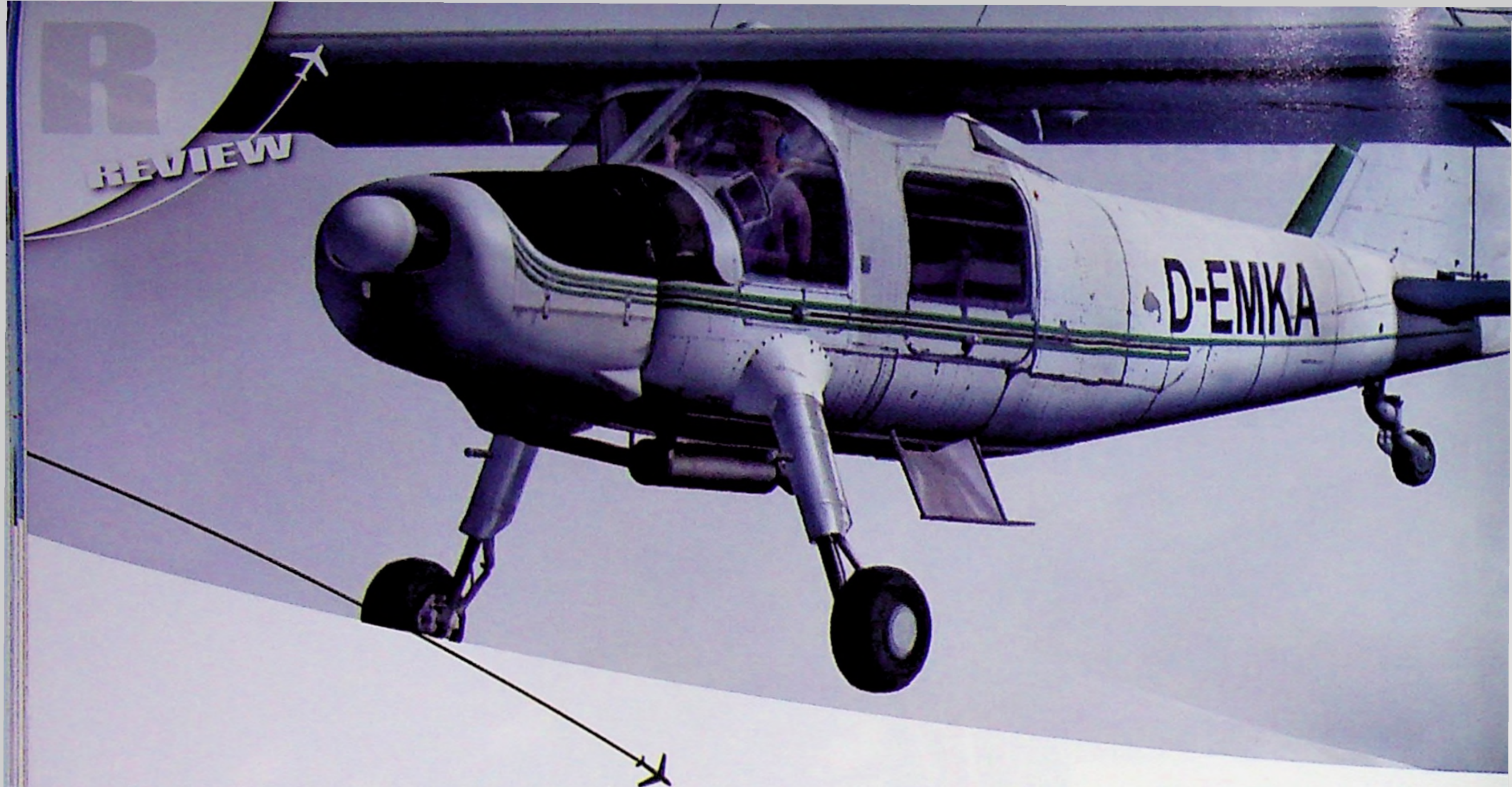


Dornier DO-27 Review

BY FRANCOIS 'NAVMAN' DUMAS

When you read this, Digital Aviation's Dornier DO-27 has been on the market for some time already, and perhaps they will even have published the FSX version by now! I had the pleasure of getting one of the first 'production models' after its release and must admit that I have not had so much fun with an FS2004 aircraft for some time!

And oh yes, this is another one of these products that would require many more pages in this magazine to do it justice, but I only have a limited number of words allocated, unfortunately. So please read this as an 'impression'.

Digital Aviation as a 'brand' may not yet be so well known (especially as they sell their products through Aerosoft and Flight1) but they are a fine group of people including such well-known names as Hans Hartmann, Marcel Felde and Alexander Metzger. Other products they have published so far include the CRJ-200, DA-20 Katana and the Piper PA-31T Cheyenne. And currently they are working on the good old Fokker 70/100! Based on the quality and depth of their creations you may rank them with the likes of RealAir, Dreamfleet, Carenado and such.

Purchase/Installation

You can purchase the aircraft as a download model via the Aerosoft Germany website, and you'll need a bit of bandwidth or patience: it is 137 Mb in size. And there is an extra-detailed texture set available of another 57 Mb, if you want. The FS9 version will set you back €17.20 (and 19.95 for us poor sods having to pay VAT), and it is expected that the FSX Upgrade will cost some 5 Euros for existing users. A boxed version will likely be released shortly as well.

The base package comes with 6 different aircraft. Yes, aircraft, not only liveries! The aircraft have various differences both on the inside and on the outside, and different pilots to match.

On installation you just click the .exe file that you downloaded and the rest is almost entirely 'hands-off'. The system will check if your MS 'dot.net' version is up-to-date, and will download it for you if not. Meanwhile a host of additional liveries have also appeared on the internet, so you can do some more downloading once you have the aircraft installed and running.

Getting Started

The aircraft comes with an impressive set of PDF manuals. You should also actually READ them, or you are likely to stay on the ground forever! Trust me, I know what I am talking about because I am one of those long-time typical 'push it and see' types having made a career of break-testing things since I was young. You will find information about the Installation itself and the included 'installation panel' (allowing you to change all sorts of settings), operational limits and such, various operating procedures (checklists) and the main Operation Manual itself.

The installation will present you with the configuration tool where you can choose to leave out the 2D panel and select instrument resolution and texture resolution. Settings here can help you fine-tune the performance depending on the 'power' of your PC configuration. I kept things at 'maximum' and apart from some loading time lag, the aircraft runs just fine on my X64 4400+ AMD with 256 Mb 7800GTX graphics card. (NOT a lowly system, granted, but not the fastest one on the market either). I tested with FPS locked at 23 and, usually, it stayed there.

Once in-flight you can dial up another configuration panel via the F8 key, allowing you to choose more parameters for effects and reality settings.

Some of the things that will happen if you do not read the manual: your stick and rudders will be locked. Yes, you started on 'Simple' and everything worked. You switched to Pro somewhere along the way. And things still worked fine. But then you must have touched one of those funny pull-switches, or perhaps you chose 'cold and dark' at some point… And whoops! Or your flaps are set to 15 degrees (1st position) and there is no way you can move that darned lever either way! The handle turns in the VC when grabbing it with your little 'hand', but it won't budge. You press F7 and you see it move an inch, but nothing more.

This aircraft requires you to read the manual(s). No doubt about it, no excuses, period!

The Flight Deck

If you did like I did, you will not have a 2D cockpit and work the plane from the Virtual Cockpit only. Ever since the VC's became more detailed and fluid I have been flying GA aircraft from the VC, as one does in real life, really. I run my FS on two (and sometimes three) monitors and will put nitty-gritty stuff such as radio stack, GPS, other switches and dials on the second monitor.

The first thing you'll notice (depending on your settings) when getting into the cockpit with running engine is that everything vibrates. The instrument panel shakes and shudders before your eyes, and when you start taxiing the world will vibrate even more, just like the real thing! After my first twenty minute test flight I did feel a bit dizzy, I must admit, as if I had just stepped off a boat. Know the feeling?

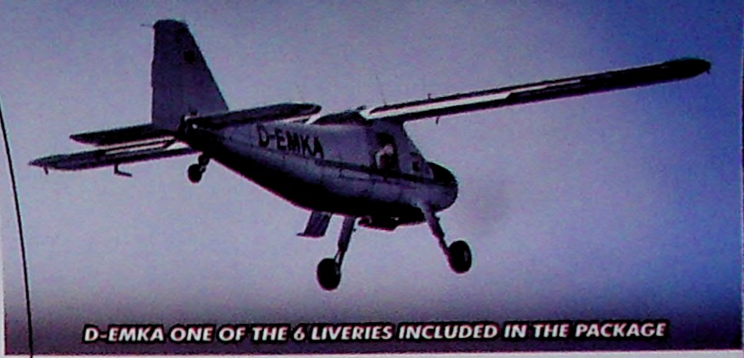
Fortunately, for those of you having real problems with that, you can turn it off or tune it down. But once you get used to it, you will actually miss it in your regular default Cessna!

The aircraft is most certainly 'dangerous' for those of us who like to push buttons, pull levers and rotate knobs in 'trial mode', i.e. without actually knowing what they are for. This way you can give a gentle pull on any of a number of yellow levers, only to subsequently lose your doors and not get them back again. It does get a bit windy in the cockpit after that!

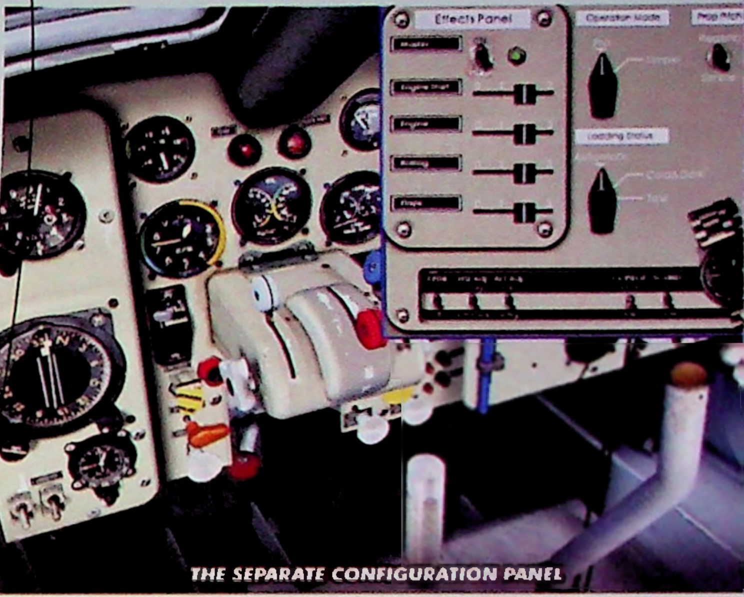
This thing has to be loaded and installed and be seen to be believed. I 'installed' the co-pilot and she even blinks her eyes (granted, my wife looks prettier… I had to write that here or else).

Making Things Move…

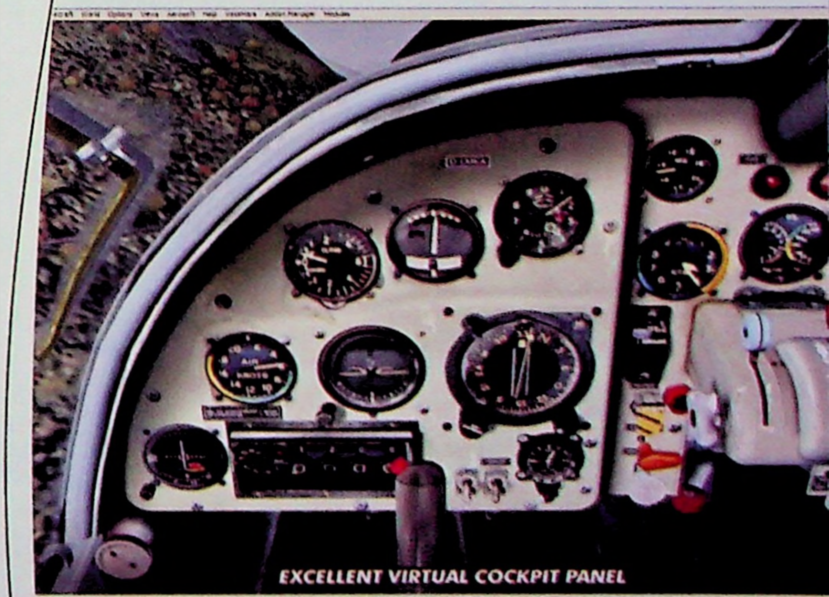
You can click on just about anything in the virtual cockpit and it will do 'something'. Yes, like losing the doors, but that only happened to me once. All switches and levers, buttons and dials can be actuated in the VC. Some instruments can be 'dialed' by rolling the mouse button (or clicking on the side), others need the little 'grabbing hand'. But there are two more things to mention.



D-EMKA ONE OF THE 6 LIVERIES INCLUDED IN THE PACKAGE

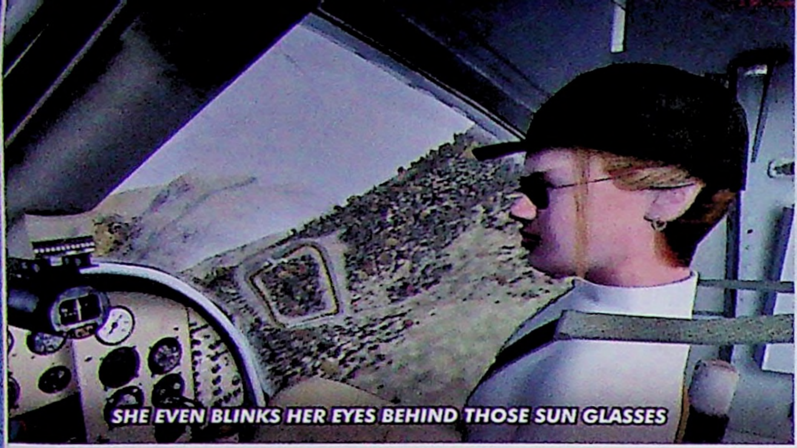


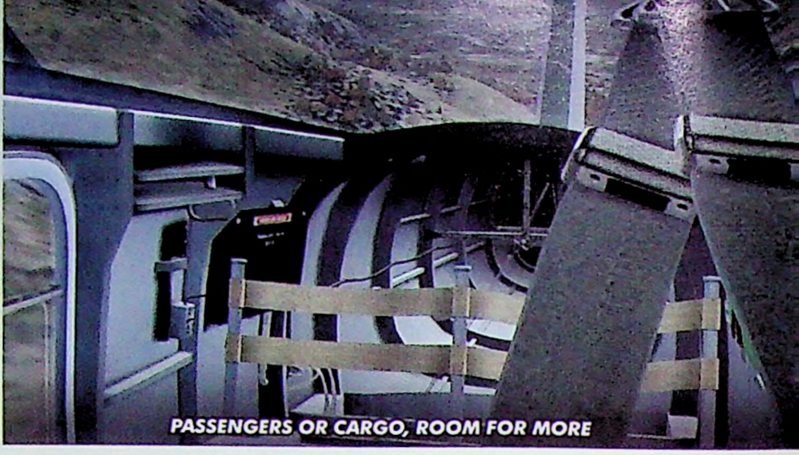
THE SEPARATE CONFIGURATION PANEL

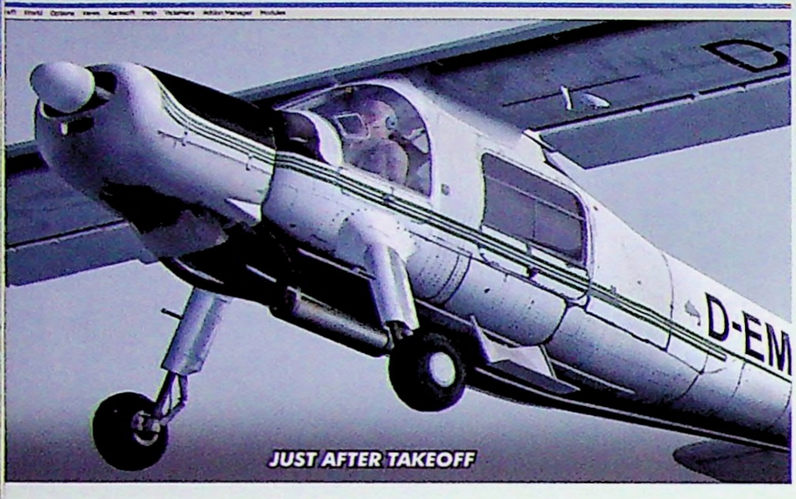


EXCELLENT VIRTUAL COCKPIT PANEL

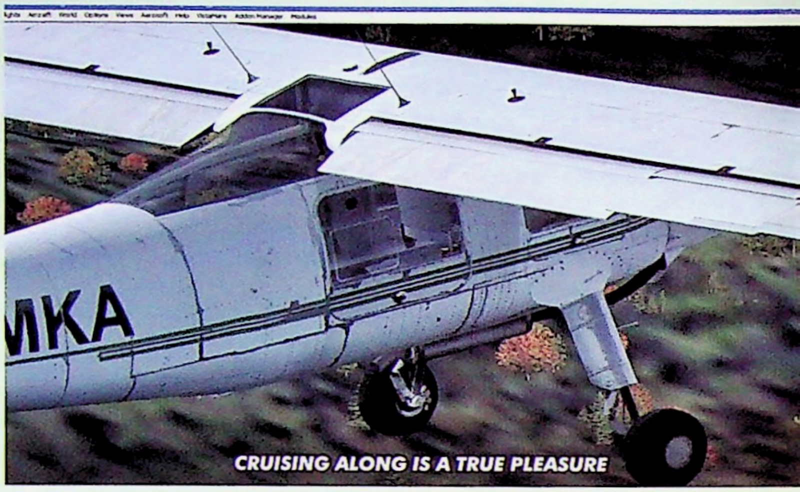
THE DO-27 LOOKS GOOD FROM ANY ANGLE REALLY


SHE EVEN BLINKS HER EYES BEHIND THOSE SUN GLASSES

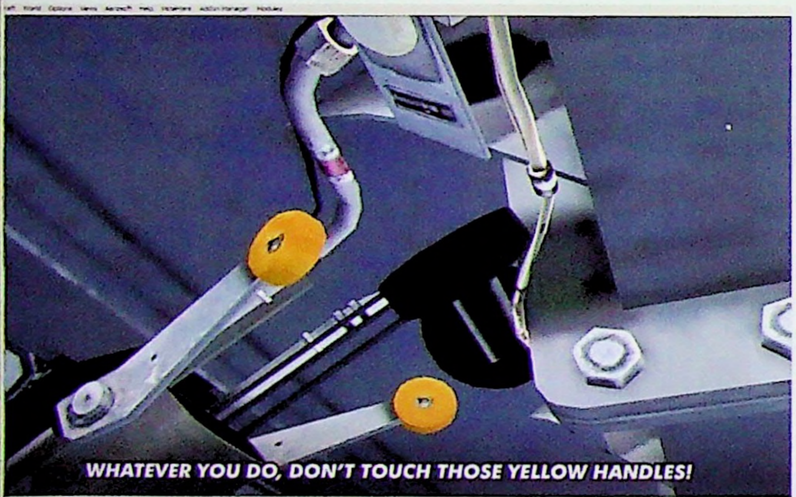

PASSENGERS OR CARGO, ROOM FOR MORE

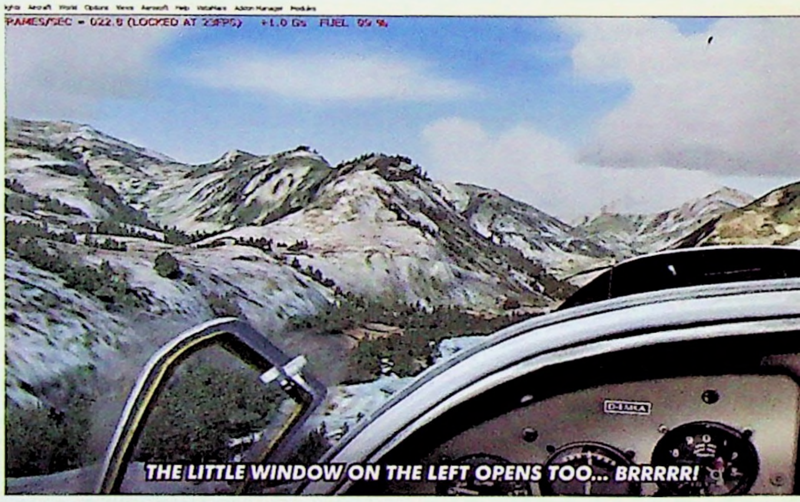


JUST AFTER TAKEOFF

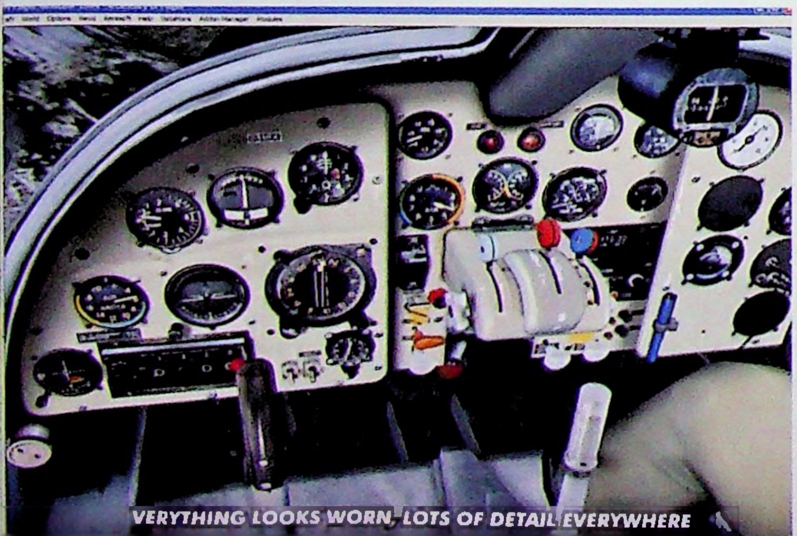


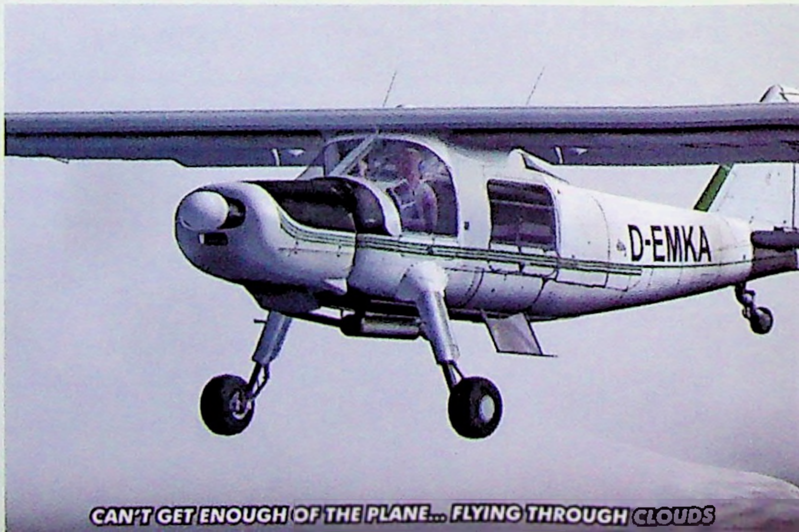
CRUISING ALONG IS A TRUE PLEASURE


WHATEVER YOU DO, DON'T TOUCH THOSE YELLOW HANDLES!

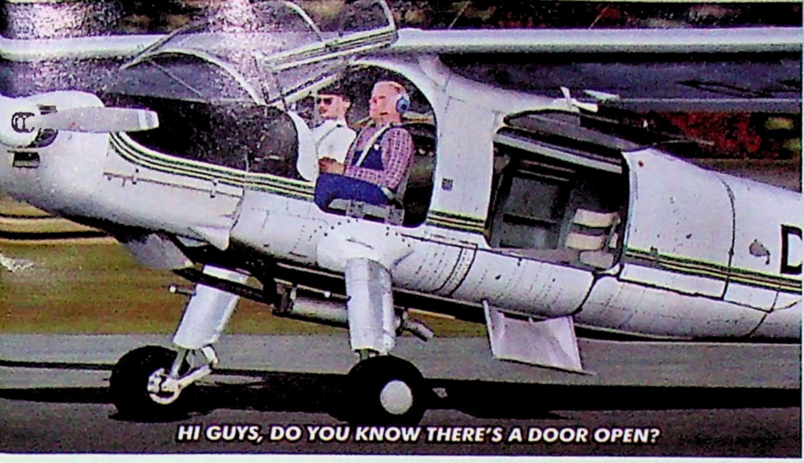


THE LITTLE WINDOW ON THE LEFT OPENS TOO... BRRRRR!

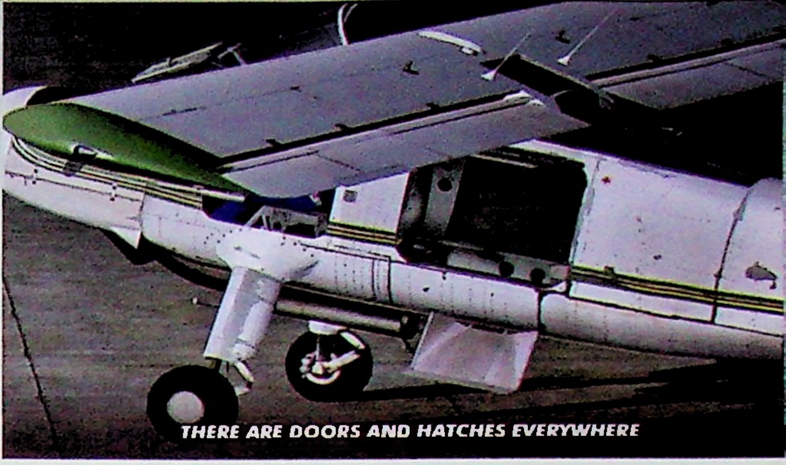

VERYTHING LOOKS WORN, LOTS OF DETAIL EVERYWHERE



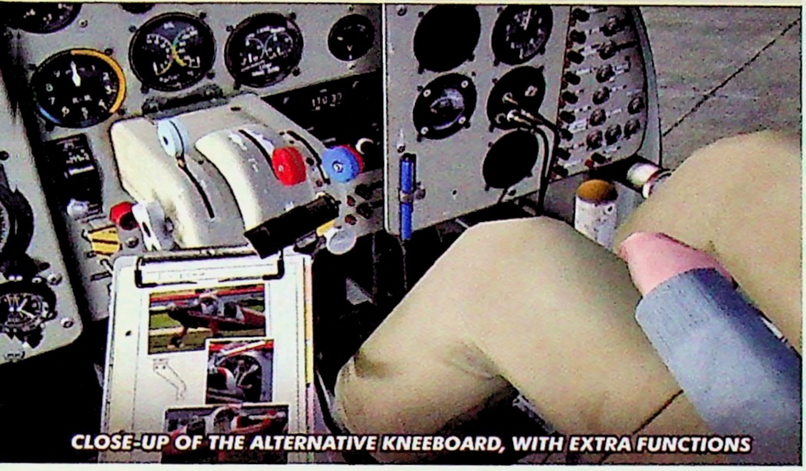
CAN'T GET ENOUGH OF THE PLANE... FLYING THROUGH CLOUDS



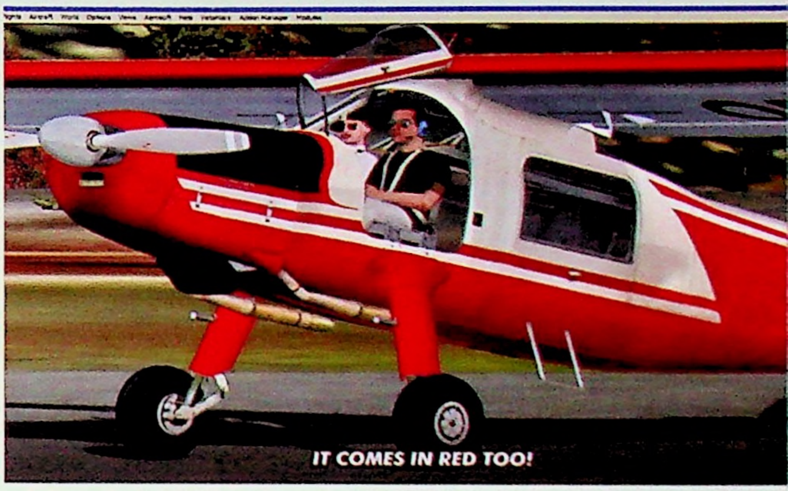
HI GUYS, DO YOU KNOW THERE'S A DOOR OPEN?



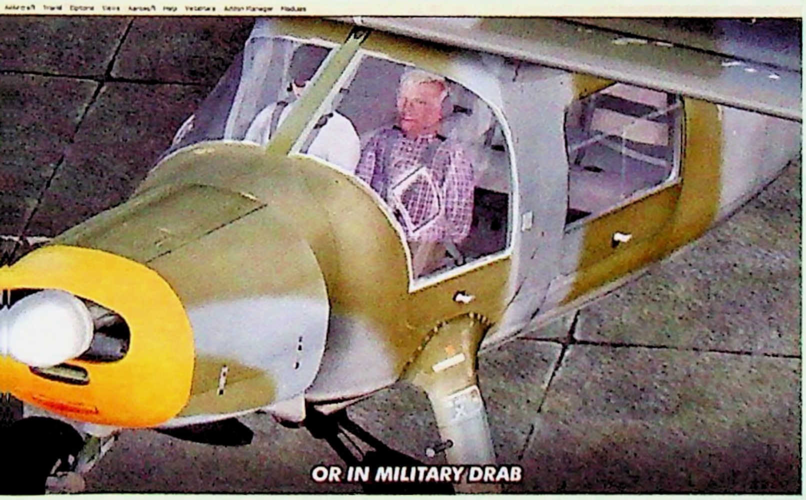
THERE ARE DOORS AND HATCHES EVERYWHERE



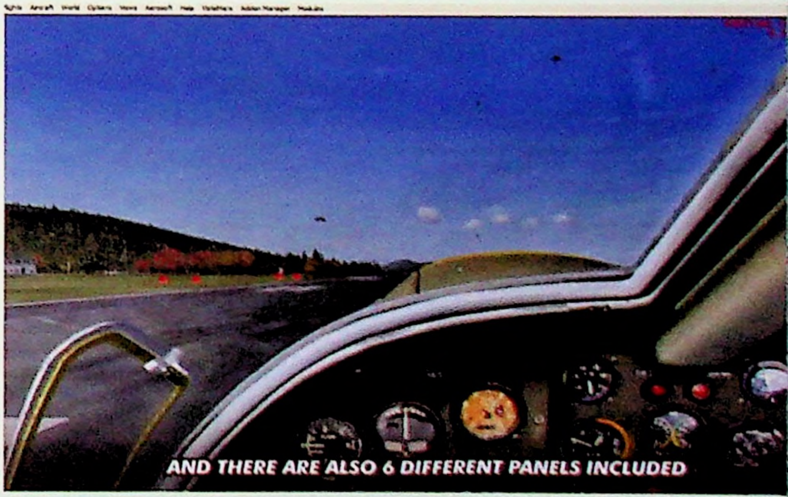
CLOSE-UP OF THE ALTERNATIVE KNEEBOARD, WITH EXTRA FUNCTIONS



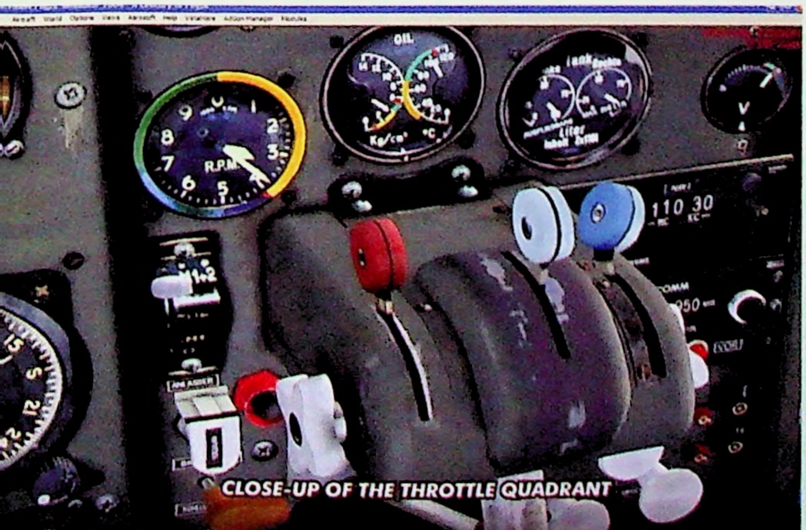
IT COMES IN RED TOO!



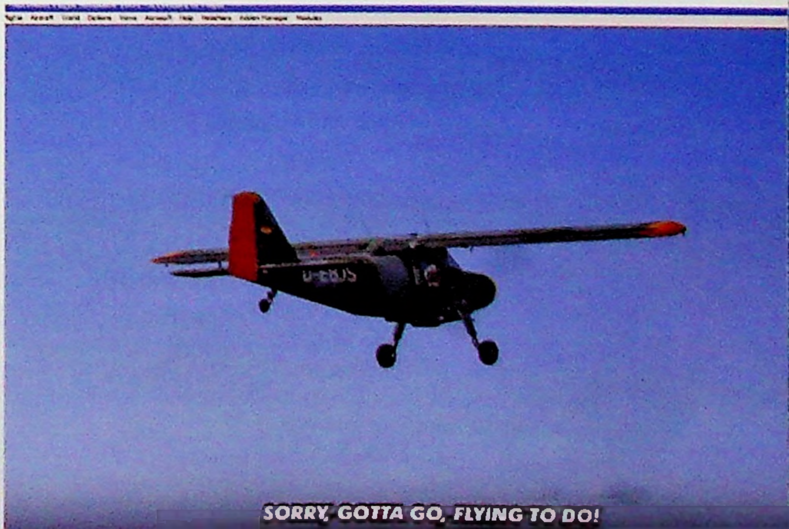
OR IN MILITARY DRAB



AND THERE ARE ALSO 6 DIFFERENT PANELS INCLUDED



CLOSE-UP OF THE THROTTLE QUADRANT



SORRY, GOTTA GO, FLYING TO DO!

The first is the selecting bar that appears on the left side of the screen after pressing Shift+9. Pressing the buttons will call up the separate pop-up windows like the radio stack, GPS etc, that you can, of course, also call by pressing Shift+1, and so on.

The other neat trick is to click on the little kneeboard with lamp that you will find in between the front seats. Click on it and it attaches itself to the main panel. It has five tabs that will call up various pages. One of them (the third) will allow you to choose various views (much like in FSX really). And you can also find a page that will help you open and close all the doors and windows. The kneeboard can also be undocked and moved out of the way (to your second monitor for instance) and actuated from there. That way you can use it to see your DO-27 in spot view and open the doors via the drawing on the kneeboard - neat!

Flying It

This is a taildragger. I am a taildragger pilot myself. So what do you expect me to write? This is fun to say the least.

As with any taildragger the view out front is not so good. You'll have to weave when taxiing, or crank up your virtual chair (not so real). But it gets airborne very fast so you only need to keep it on the centerline for a short time.

In 'simple' mode the aircraft flies really gently and has no surprises for the unwary pilot. In this mode it is a terrific platform for VFR pilots and scenery lovers, and I use it often as such now. Its low speed and great STOL capabilities let me take it anywhere, except in front of landing airliners on busy airports.

But set the aircraft to Pro Mode and we are talking business! Now you will have to stick to the 'rules' of the plane. It still flies very well, but is less forgiving in terms of motor and prop management, and abusing it too often can actually make you crash!

What are some of the many things modeled? Hold on to your chair, here goes: You can really damage your engine and gear by things such as too high RPMs, or too low RPMs, long engine starts or low oil level. It can even catch on fire, but not to worry, you also have an active fire extinguisher, which can empty when used too often leaving you with another problem! Or how about the fact that the engine really starts losing power when it gets worn? Some of the gauges can malfunction when you turn on the avionics master switch when starting the engine, or upon hard landings.

Other things that are faithfully modeled include the slow starting propeller, the many doors and their opening sequences, the detailed engine under the hood, various pilots (I thought I recognized one or two of them?), and even exterior objects such as a tent and other camping equipment in case one flies to a fly-in or airshow.

You will need to print out the various lists and try and learn them. The engine is a stickler for the proper RPM settings, prop pitch, fuel flow and more. Do things incorrectly and you'll either damage it immediately, or wear it out over the longer run.

One of my favorite things was to start the engine from cold and dark using the proper procedure according to the excellent documentation. Then running it up, slowly warming the oil. You won't be able to adjust the prop pitch when the oil is still below 70 degrees Celsius! So yes, this will keep you busy for quite some time before you can even start to think about taxiing. So who is in a hurry?

Some More Fun

Once you have accumulated enough hours in the DO-27 (some 50 are said to be needed to really 'control' the aircraft) you may want to start looking for something to do besides flying the local circuit. Included in the package is a 'Para jumpers' mode, where you will take some parachutists on board and drop them back onto your departure airfield. You can not actually 'see' any of this, but you will hear the actions. When you fly level over the airfield at less than 70 kts, you will all of a sudden hear the left door open and the jumpers exit. Your 'score' is kept and visible on your kneeboard. Oh, and you can close the door by settings your flaps to 15 degrees, where the deflected air will push the door closed again, unless of course you forgot to block the wing latch, in which case the door will remain stuck open, and then you have a problem

Also, don't forget to fold the co-pilot seat back so there's more space for the jumpers. How else would you get 5 humans in that little plane? It is a miracle it gets all 6 of us off the ground to begin with!

Oh, and you actually get certificates for gaining hours (in Pro Mode only), so you have some proof to show to your dear wife. "…No dear, I have been flying the sim, not hanging out at the local gambling den! Look, here's my certificate!..."

After all the abuse the DO-27 gets from you, certainly in the beginning, you may be stuck on the platform with an engine that fails to start altogether. Yes, it happened to me, no idea what I did wrong to make things go bad on me. But it happens. Fortunately, you can also have the damage repaired. So even if you are a 'bit rough' at times, just make sure to reference your kneeboard and have the mechanic check the plane after every flight. That will keep you airborne and save you embarrassment on a Sunday morning with some passengers waiting for a little tour over the local field.

And there is more you can do with the DO-27 on a sunny Sunday afternoon (although be aware, warm weather can cause air bubbles in the fuel system, and you'll need to turn on the fuel pump). Since this is a STOL aircraft it is ideal for putting it down on (and taking off from) these small bush and mountain fields. It only needs 250 meters (750 feet) to clear an obstacle of 45 feet and is happy with less than 600 feet of runway to get it back on the ground again. The above figures are of course not valid when entertaining five burly para-guys in the cargo hold!

Conclusion

The DO-27 is a very 'special' aircraft. It has a (real) history, is 50 years old and not seen much around the world. In the simulator it provides a lot of pleasure to fly for 'beginners' and pro's with not much time on their hands. But it excels if you want to really learn how to fly it and put it to Pro Mode. Read the manuals and practice!

Of course all the excellent little details like opening engine covers, in-cockpit click spots and such are great, as are the wonderful graphics and highly detailed cockpit panels. What sets it apart from the other aircraft in its class though is the 'don't break it' idea behind it. You will have to keep engine and airframe wear down by flying it within the published limits, otherwise your maintenance log will quickly show you how expensive aircraft maintenance really is! Or worst case, you'll go down in flames without ever getting it back to the field for the necessary repairs.

So isn't there anything bad to mention, apart from the dirty windows with the crack in the windshield? Not really, no, or it would have to be the door handle of the co-pilot's door. I had to really wriggle with my virtual pilot to get to it, since 'Julie the co-pilot' did nothing to help and just kept scanning the virtual skies, blinking her eyes and sitting still. Had she hopped out to do a walk-around, then this aircraft would have been 100% perfect!

As it is, it still is a definitive must-have for the 'reality freaks' among us. ✈

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CARGO PILOT Review

BY GENE DAVIS

First there was Airline Pilot and now there is Cargo Pilot, based on almost the same engine and premise as its original title. Cargo Pilot introduces the virtual pilot to the world of cargo transport and managing a successful company from the ground up.

The folks at Just Flight have created yet another interesting take on the world of cargo transport, though I do find it a little reminiscent of the old airline management games from years ago. The program offers up some interesting challenges to the armchair pilot. The benefit here is that you not only get to manage the company you own, but you get to fly the plane in Flight Simulator too.

Download Or CD?

The product that I reviewed came to me in the form of a download, though I would recommend that if you want to own this product do get the DVD-ROM version as it comes with a printed manual and that will make reference to it much easier. The download version comes with a PDF manual, but making quick references to it is rather difficult when you are running both MSFS and Cargo Pilot together as both programs don't like jumping back and forth to Windows. The other good news is that Cargo Pilot will work with either FS2004 or FSX and the included switch utility will allow the user to switch between the two simulators. If you are like me and still find that FS2004 is your primary sim and use FSX only when you feel like doing something a little different, this switch makes it easy to jump between the two, so I thought!

Installation is a breeze, simply follow the on-screen prompts and enter the registration key if you are using the download version; here is another reason to buy the DVD version, no registration key! You will need to select where you want the product installed. The installation program will ask which version you wish to install and it will install to that version of Flight Simulator on your hard drive; in my case I initially chose to install Cargo Pilot into FS2004 because I figured that would be my sim of choice.

What It Does, and Doesn't Do...

Cargo Pilot essentially offers the virtual pilot the opportunity to create his or her own business in the world of MSFS. Cargo Pilot will help you build a small cargo company by tracking flight information, tracking wear and tear on aircraft, and offering cargo flights from virtually anywhere in the world.

Cargo Pilot also offers up a painting utility for personalizing his or her own default aircraft. Now, mind you, I said default! The paint utility is designed to work with the default planes alone. Though I think a creative simmer could probably personalize his or her own aircraft without it.

What it doesn't do is add scenery; in fact there is little in MSFS to even know that it is there except for the menu option on the top menu bar in FS2004.

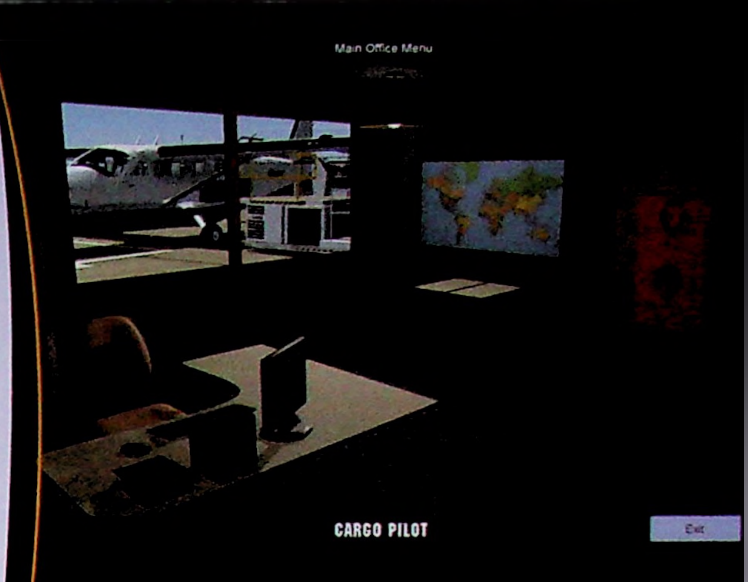
Open For Business

Getting into Cargo Pilot is relatively easy, though you will have to wait for the product to scan your scenery and aircraft files when booting the program; sadly this occurs every time you launch it, even if you are going out of FS2004 and back into Cargo Pilot to close the flight it will scan again, again and again.

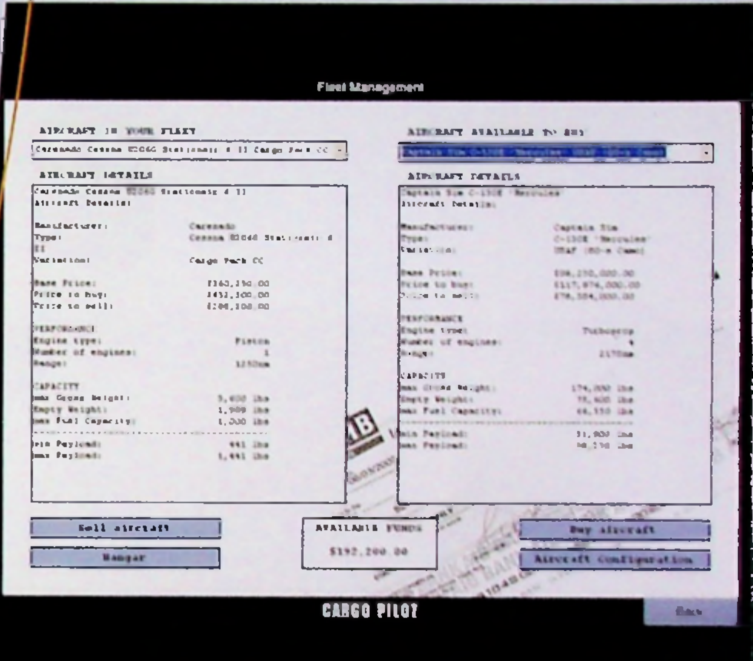
When you start Cargo Pilot and when the scenery compiling is done you will find a very familiar FBO office. There you will find an array of click spots and these are: general options/setup, map for selecting new bases of operations and examining the current, aircraft configuration and purchase screens, and filing cabinets that hold all of your pertinent company information and current stats. Lastly, you will find the door! No, this is not the door showing you the way out but is the portion of the program that allows the user to select what type of goods are to be delivered, as well as showing you where the those goods are going. It also serves as the launching platform for MSFS. In the options and setup click spot you will find an option to have Cargo Pilot set up your weather for you; the harder the difficulty level the worse off the weather will be.

Creating the company is the easy part. This is done by clicking on the filing cabinets and selecting the appropriate sub-menu and creating a name for yourself as well as setting the difficulty level and the length of the overall game. The next step is picking a geographic location to operate from. This can be done from anywhere in the world, but be warned, the more remote the location the less short range flights you will have. This really isn't a big problem with flying the heavies, but when you are starting up, type of plane and range is going to be an issue. Once you have selected a location you will notice that more of your money has gone away! This covers the startup costs and airport fees for your fledgling company.

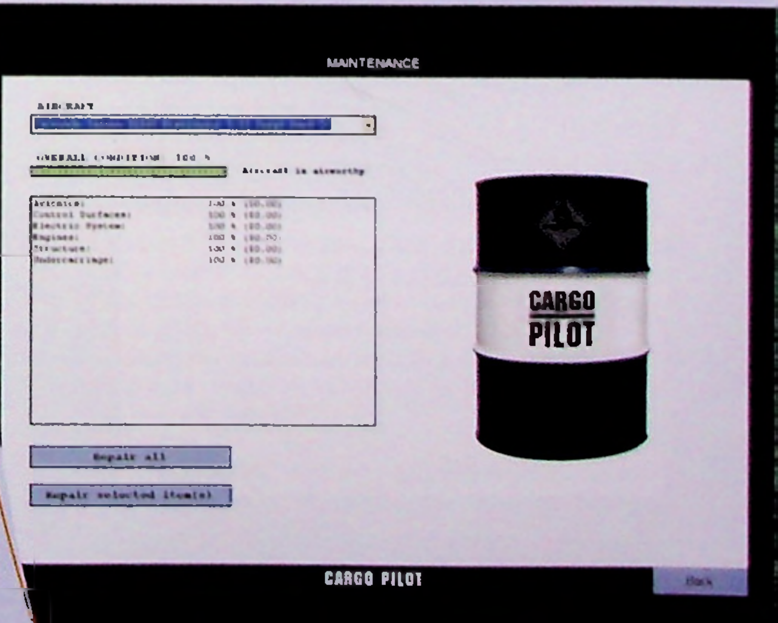
Purchasing the aircraft is your next step. This is completed in the company creation screen and further purchases are made through clicking on the big picture window in the FBO office. It is important



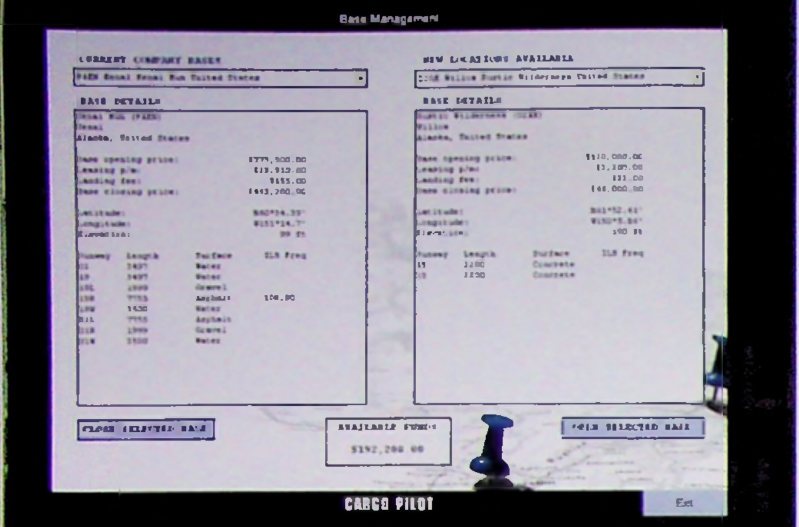
THE CARGO PILOT OFFICE



LOOK AT YOUR CURRENT PLANE OR BUY A NEW ONE!



CHECK THE CONDITION OF THE PLANE.

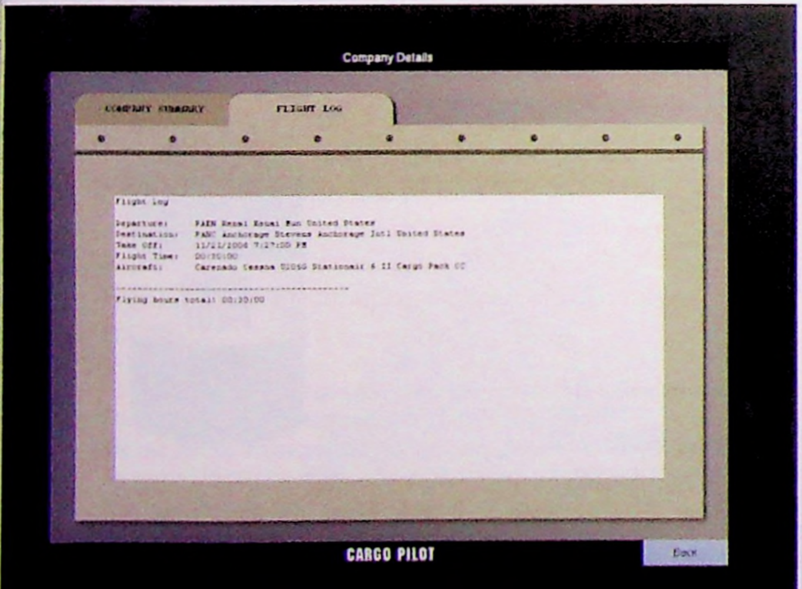


CURRENT BASE OF OPERATIONS OR SELECT A NEW ONE IF BUSINESS IS SLOW.

EN ROUTE FROM PAEN - PANC, FULLY LOADED!

APPROACH INTO PANC, RWY 6R

WAITING TO TAXI TO GENERAL AVIATION PARKING

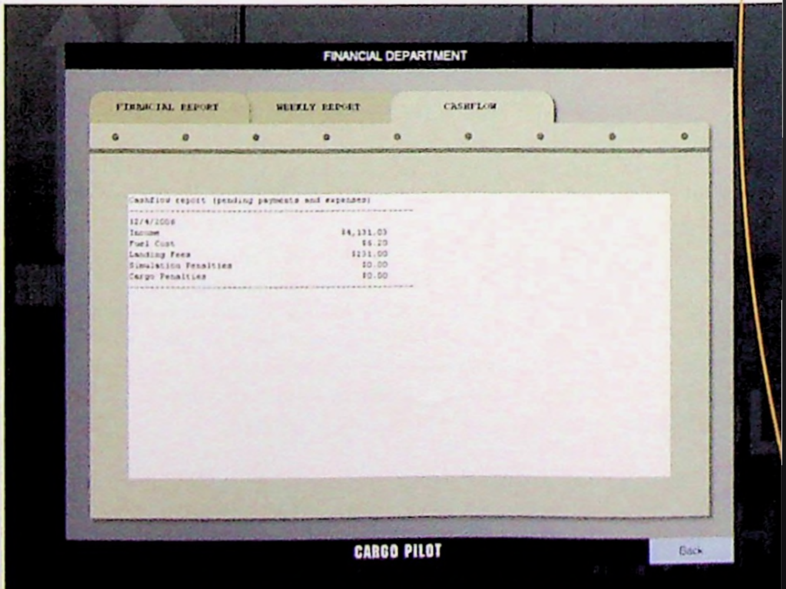


```
Flight Log

Departure:      PAEN Kenai Kenai Mun United States
Destination:    PANC Anchorage Stevens Anchorage Intl United States
Take Off:       11/21/2006 7:27:00 PM
Flight Time:    00:30:00
Aircraft:       Carenado Cessna U206G Stationair 6 II Cargo Pack CC

------------------------------------------------
Flying hours total: 00:30:00
```

FLIGHT LOG, GOOD TIME!



```
Cashflow report (pending payments and expenses)
-------------------------------------------------------------
12/4/2006
Income                                          $4,131.03
Fuel Cost                                           $6.20
Landing Fees                                      $131.00
Simulation Penalties                                $0.00
Cargo Penalties                                     $0.00
-------------------------------------------------------------
```

CASH FLOW REPORT, MONEY, MONEY, MONEY!

to pick the plane wisely as you will have to rely on it for quite some time. I found that the Cessna 206 works as a good choice, but if you are using FSX you may want to use some of the default aircraft. You must take fuel and cargo capacity as well as the actual distance the plane will fly into account when choosing an aircraft, and again, your geographic location plays a major roll here.

Once the plane is purchased you are ready to move on to the next step and that is picking a load to transport from your base of operations to a predetermined destination. This is where the product comes up short. The program sets up flights based on your location, but doesn't take into account the size of the airplane as many of the flights I had to choose from were much too long for a Cessna 206 and were geared towards larger aircraft, and when you don't have a lot of money to start out with it makes it kind of difficult to buy a twin engine or even a jet right off the bat and have a good geographic location to fly out of. In one instance I picked a little dirt airstrip way out in the middle of nowhere, bought the Cessna 441 but found that I didn't have enough runway to get airborne!

Cargo Pilot with FS2004

Initially I set up my first try with Cargo Pilot using the Flight 1 Pilatus PC-12. Well I had enough money to buy it, but when it came to choosing a location for my FBO I didn't have enough money left. The next step was to try it with Lion Hearts Quest Kodiak. I was able to buy the plane and set up my FBO in Kenai, Alaska, but I found I couldn't launch FS2004 through Cargo Pilot with that particular aircraft, so I was back to step one.

I finally settled on the Carenado U206 and Kenai (PAEN). Now it was time to go and select a flight. The next problem occurred when I loaded up the flight list and all I had were flights that were way too long for that particular plane. If the plane is overloaded or if you don't have enough fuel, Cargo Pilot will not let you out of the program to get into MSFS. I thought this to be a problem at first, but you can go into the aircraft setup menu within Cargo Pilot and change the default fuel and cargo values for the selected plane, thus allowing you to make stops if necessary to refuel. I guess you might call it a manual override of some type.

Once in MSFS you will find your plane parked cold and dark at your selected base of operations. This next step is very important, make sure you go to the FS menu and open the Cargo Pilot drop-down menu and start the tracker - I assumed it was on the first couple of times!

My first flight was a short one and it was from PAEN to PANC with a load of US Mail and furs. Total payout upon delivery would be about $4400.00, minus the landing fee at PANC which is about $350.00.

Before you activate the tracker make sure to set your desired time. Cargo Pilot will take care of the weather for you and it is based on what the difficulty level is set at in the add-on. Preflight is very important as you are being tracked and damage to the plane, flight violations and poor engine performance will all cost you.

As I set off for my 30 minute flight to PANC I went through the necessary checklists and contacted the tower to be cleared for my IFR flight to PANC. After clearance I was then handed to ground for taxi clearance and then eventually handed over to the tower and I was on my way. There is a flight plan filed within MSFS so everything is ready to go when you start your flight, GPS is set, as are all of the NAV instruments.

The overall flight was uneventful and I made a successful ILS approach onto RWY 6R and eventually parked and shutdown my 206 at the General Aviation yard at PANC with little or no fanfare. Shutting down the engines resulted in nothing, but when I went to the menu option for Cargo Pilot it said that it had saved the flight information. Exiting from MSFS took me back to the core program of Cargo Pilot, where by clicking on the door again, you know the one they used to go out of for the flight, showed me a debriefing log. This step must be taken and in order for the program to save the info you MUST click on "save", otherwise you will lose it all.

Cargo Pilot with FSX

This sets up about the same as the FS2004 version, but I found that trying to get it to work is a challenge all in its own. Even while trying to get the company started the Cargo Pilot program crashed on me 3 times and dumped out the first two times I tried to run it with FSX. At one point Cargo Pilot and FSX crashed Microsoft Net Framework. Ultimately, I was eventually able to pick a remote airstrip in Canada somewhere, buy my 208 and get into the sim only to find that the menu option for the tracker was missing. The next step was to manually connect Cargo Pilot with FSX by navigating to the Cargo Pilot directory in the FSX folders as per the directions. This was also a futile effort to make it work as the program would not connect to FSX, I just kept getting a message saying that the program was unable to connect.

I was really excited to include the FSX portion of this add-on in my review, but it simply proved to be too much of a challenge and would not run properly. After a quick check at the Just Flight website I found a small update, though it was my understanding that my download was the latest version.

Ultimately I decided to uninstall Cargo Pilot from my first installation which was into MSFS 2004 and reinstall it directly into FSX, this also proved to do nothing and I was again left with a non-functioning tracker.

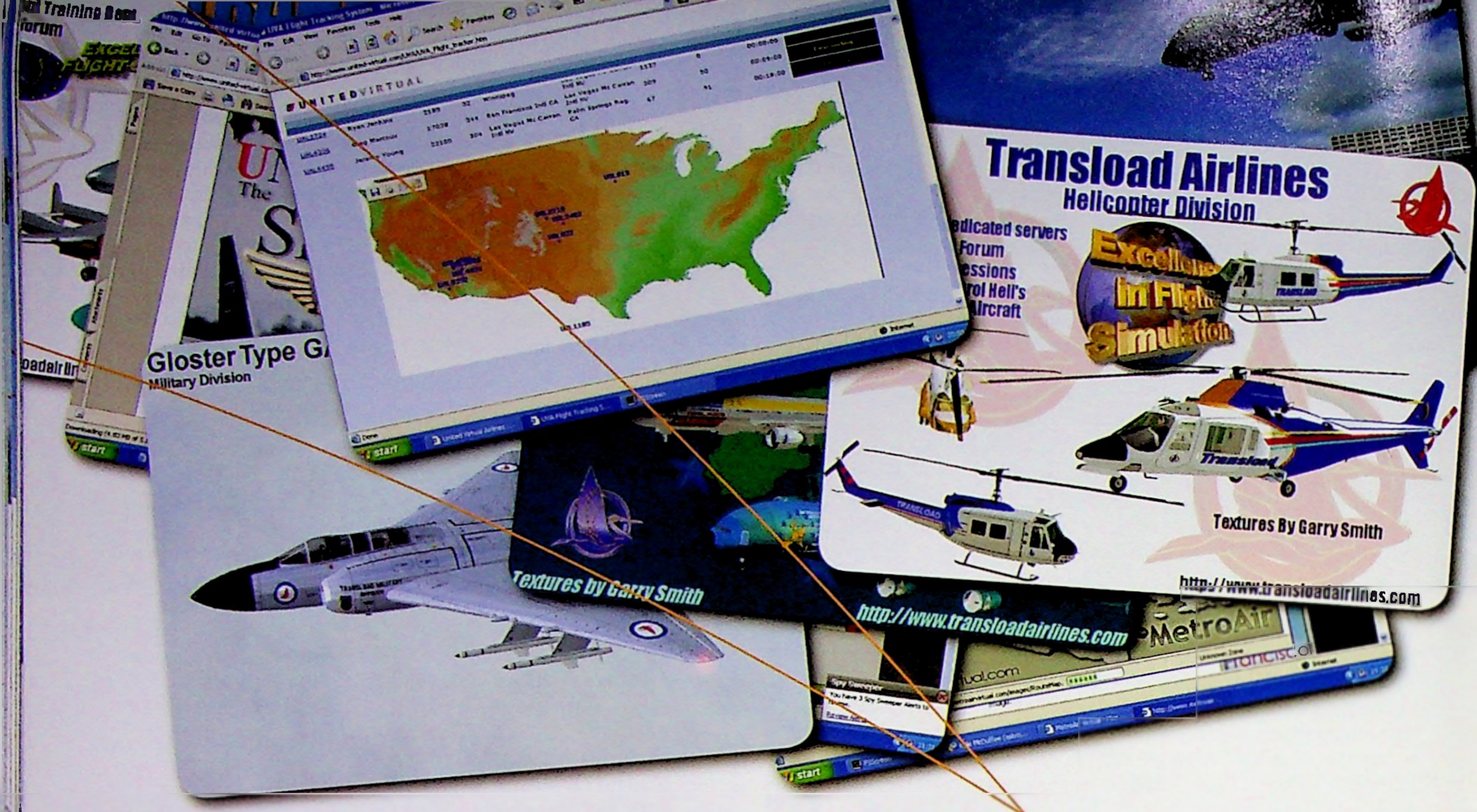
It is also important to note that if you are going to uninstall and reinstall, the program does ask if you want to keep the profiles or not, but after telling it to store them I found that they had been deleted after all.

Sadly, I was not able to make the paint utility work with the aircraft in FSX. This was my motivation for using Cargo Pilot with FSX simply because I do not fly the default aircraft in FS2004, but find the ones in FSX a little more enjoyable.

In The End...

Is this program for you? Well I am not sure it was really for me. I once owned a business and I don't really care to bog down my Flight Simulator experience with unwanted virtual expenses and schedules. I just like to go and fly. I know there is a large following for these programs and for some I am sure it is a lot of fun, but I just don't have the time to devote to building a virtual company that would exist within MSFS. In all it's a great premise and does offer a lot to the overall flight simulation environment by giving the user a business simulator to use right along with MSFS, and for that, this program is well worth the time and patience.

Cargo Pilot (DVD version) retails for US$49.99 and is available from good flight simulator retailers worldwide. It is published by Just Flight. ✈



Virtual Airline Profiles

BY ROGER CURTISS

We continue our close-up look at more online virtual airline groups. Part of the enjoyment of flying with a virtual airline is in finding one that best suits your flying needs… Try these virtual airline groups on for size…

United Virtual (UVA) www.unitedvirtual.com

UVA seeks to simulate the real world flight operations of United Airlines (UAL) by using the UAL schedules and aircraft. It has been in continuous operation since February, 2001 and has grown to become a significant online VATSIM-affiliated virtual airline.

History

In June, 2003, UVA consisted of 50 members and some of those members were employees of UAL. They obtained the support of the airline to assist the VA, a unique situation as most real-world airlines are leery of lending their name to their virtual counterparts. UVA conducted its first online group event in early 2004 - a DEN-SEA flight to show its strong VATSIM presence. This helped the VA to expand to the point where in mid-2004 it boasted over 600 members.

The VA management continued in their efforts to grow and provide services to the pilots. By the end of 2004 the VA offered a schedule of over 4000 mainline and regional routes. They also hosted a six hour online event, the" Chicago Holiday Rush", with the idea of replicating UAL's operations at KORD.

2005 found UAL suspending active involvement with the VA but continuing to allow UVA to use copyrighted materials and regular updates of their flight schedules. UVA has subsequently introduced an automated passenger load system and a sophisticated FSAcars program that allows tracking online flights in real time, filing flight reports and providing a secure network for pilots to communicate with one another. Pilots need only reserve a flight and the FSAcars system automatically processes the associated flight information.

Flying the Line

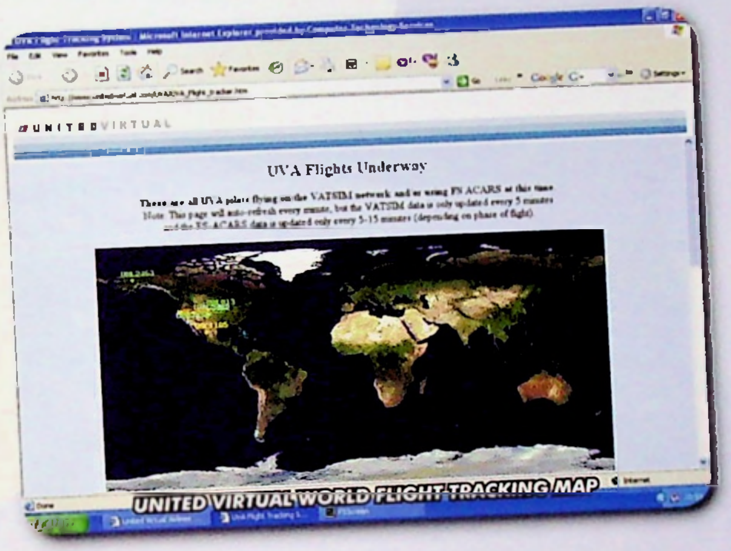
UVA's goal of realism utilizes the official UAL flight schedule. The schedule is updated on a monthly basis to reflect actual UAL flying.

The VA fleet is tracked using the actual registration numbers of UAL aircraft and once a pilot reserves a particular flight an aircraft will be selected to fly it. This will either be an airplane that was flown to that airport on another UVA flight or one that was parked at another airport and then "ferried" to the specified departure location. Theoretically, there could be occasions when all aircraft of a specific type would be in use and not available for a reserved flight; however, this situation has not yet occurred due to the large size of the UAL fleet.

Pilots are assigned to one of seven US domiciles as a base of operations but are free to select any flights for which they are qualified.

Pilot proficiency is gauged not only by safely completing flights but by efficiency as well. Pilots are expected to complete their flights on time and keep to the schedules. To that end, points are awarded for each flight with a sliding base scale of 10 to 375 points based on rank. In addition, points are awarded or subtracted for early, on-time or late departures/arrivals.

The emphasis on realism is greatly appreciated by many of the UVA pilots. A recent survey found that 62% of the respondents choose to fly for UVA because it represents United Airlines.



UNITED VIRTUAL WORLD FLIGHT TRACKING MAP

Promotions

New pilots begin their UVA careers as First Officers flying the Category 1 turboprop aircraft. The only exception is that pilots with at least 100 hours verified virtual airline experience begin as Second Officer on Category 3 aircraft (A/320and B737 series). Pilots advance in rank by accumulating flight hours and are eligible to advance to the next category of aircraft after amassing a defined total of hours. There are six categories in all and by the time a pilot is ready to take a Cat 6 checkride (B747), 285 hours minimum will have been flown.

The checkrides for each successive category are made increasingly more demanding by requiring the pilot to manually fly more aspects of the flight thus ensuring that pilots are advancing their flying skills and not merely becoming more adept at pushing buttons on the autopilot.

In keeping with the mandate to replicate United Airlines as much as possible, the pilot ranking and promotion system is scheduled for a major revision to align UVA more closely with procedures used by UAL. This will include training, type ratings and written exams. That effort is being guided by a retired UAL B777 Captain and is due to debut in Spring, 2007.

A Full Experience

The UVA management is very involved with their VA and strives to continually fine tune what can be offered. Member surveys are conducted to determine preferences and to guide the future direction of UVA.

One of the unique features is an online publication 'The Shield', an in-house magazine begun in late 2004 that offers the staff an opportunity to communicate to the pilots as well as presenting informative articles dealing with aircraft operation, navigation, weather and other topics of general interest.

UVA has a proven record of providing a rich VA experience for its members, responding to their needs and educating while entertaining them.

Transload Airlines (TVA) www.transloadairlines.com

Since 2002, Transload has strived to "bring like-minded flight simulator pilots together and give them new and different goals to achieve using their flight simulator program. Pilots will be able to achieve higher pilot ranks and more hours as they progress in their virtual career. Hopefully, throughout their career pilots will face new challenges and achieve a new level of enjoyment and virtual airline participation."

TVA has set a lofty goal for itself and has sought to achieve it by offering a plethora of choices to suit almost every type of flying:

- 13 divisions
- a huge hangar of aircraft
- dedicated scenery packages
- private servers for flying

MET 737 AT THE GATE

Divisions

TVA, in its effort to be a 'one-stop shop' offers 13 distinct divisions for pilots to indulge themselves in their passion for flight:

CIVIL - the largest and most active division. Pilots are based at the super hub KDEN or at TVA's private international airport YTL1 in Tasmania. Civil pilots fly a wide range of aircraft from small propeller to large commercial jets.

CARGO - like the Civil Division, Cargo flights are route-based but pilots are not subjected to the necessity of catering to passengers.

CONNECTION - based at KAPA Centennial Airport in Colorado this is basically a regional airline operation.

BUSINESS - similar to Connection in regard to the aircraft used, but operation tends to be longer routes and last minute specialty flights.

EUROPEAN - a compilation of aircraft from other divisions but with a few of its own as well to provide a home base in London for European members.

OCEANIA - same as the European division but based at YTLI.

NOSTALGIA - No aircraft designed after 1940 allowed and no autopilots. Operating the Curtiss Jenny, Ford Tri-Motor, Vickers F.B.27A Vimy and the Douglas DC-3.

HELICOPTER - something for rotor heads.

BUSH - basic backwoods flying in Alaska, Australia, South Africa, and Canada plus the South American rain forests, African jungles and Baja Peninsula. Perhaps not for everybody but paradise for some.

TRAINING - a full range of flight instruction offering certificates in flight simulator operation, online flying, ATC procedures, Private Pilot course and an Instrument rating.

AIR FORCE - air defense and attack from 6 worldwide bases: Japan, Florida, Texas, Guam, Australia, and Greenland.

NAVY - 6 worldwide bases: Italy, Oceana, Japan, California (2), Cuba and 6 aircraft carriers with catapult and arrestor capabilities.

ARMY - ground support aircraft and helicopters from 6 bases: Bosnia, Kentucky, Alaska, Guam, Germany, Iraq.

Pilots are welcome to fly for any or all of the divisions as they wish.

TRANSLOAD EURO 777-300

Aircraft

Transload claims to possess "the largest aircraft fleet in the world". This does not appear to be an idle boast. Each division offers at least 8 different aircraft types with a multitude of liveries for a total selection of 232 aircraft bearing 325 different paint schemes. In addition, TVA has 43 different AI aircraft sporting 91 liveries and 11 military ships.

Perhaps most impressive is that all of these liveries have been created by one man, Garry J. Smith, a TVA pilot who also functions as the manager of the Oceania division. They also have well known aircraft designer Mike Stone on board managing the Cargo division and providing some of his excellent flight models as well.

Scenery

This is an area under development and projected for rapid growth. YTLI has been created and it features the usual facilities as well as a grass runway and a seaplane base. Plans are to offer military bases, bush pilot bases and additional facilities worldwide to accommodate the varied flying of all 13 divisions.

AUBREY BARRETT 737

Servers

I have been active in the online flight simulation community for over 10 years but had never heard of Transload and could not recall having heard that callsign while flying or controlling. It turns out there is a very good reason for that- Transload does not operate on VATSIM/IVAO. Instead, they utilize three private servers for online activity. This allows them much flexibility to schedule events wherever and whenever they please and to fly without having to compete for airspace with other VA pilots, some of whom may have questionable flying skills. It also allows them to host civilian flights on one server, military on another and use the third for training activity.

Voice communications online are handled by a Teamspeak server for ATC and chat services.

TVA divisions schedule a variety of different flight activities each week striving to feature a new route with different aircraft:

Monday - Connection Division
Tuesday - Bush Division
Wednesday - Training night
Friday - Military Division
Saturday and Sunday - Civil Division

Career Progression

TVA has 9 positions of rank and advancement is based on flight hours. Pilots progress from Trainee to an Executive Captain at 200 hours.

Transload tries to maintain a loose environment with an emphasis on group participation and a strong forum community. Many of its members have joined because they were unable to meet the stringent flight requirements of other VAs and are appreciative of the open atmosphere cultivated at TVA.

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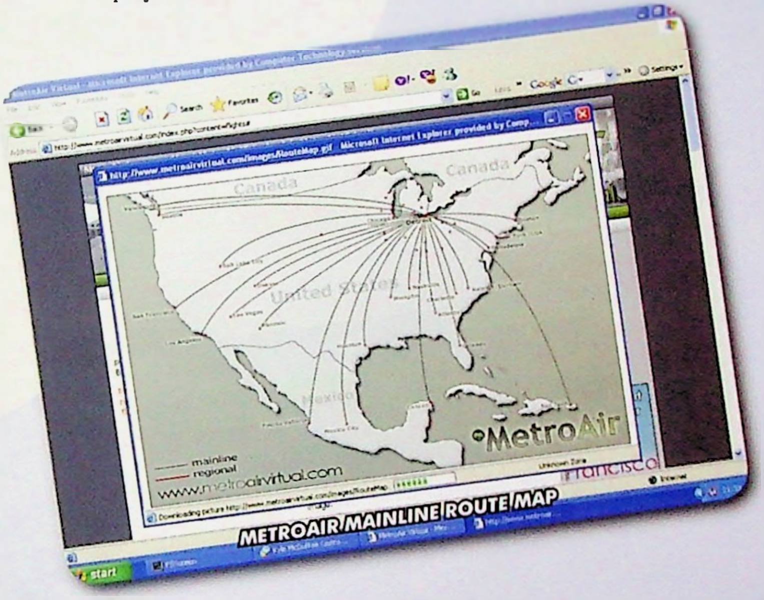
MetroAir Virtual (MAV) www.metroairvirtual.com

The premise of this series of virtual airline profiles is that there is a wide variety of VAs that seek to explore the flight simulation world. Each one is formed with an idea of doing something just a little bit differently than already existing VAs; be it emulating a specific airline, flying a specific type aircraft, flying to particular locations, or just trying to bring a new dimension to the experience. It is in the latter category where MetroAir Virtual has sought to carve its niche since commencing operations in Fall, 2005.

MAV touts that it makes, in the words of its CEO Mark McCoy, "full-use of the business element in successfully running and operating an airline within the safe confines of the virtual environment".

McCoy says that MAV was built from the principle that all elements; routes, fleet, manpower, equipment leases, landing slots, maintenance, etc. would be predicated on the element of fiscal reality. While some VAs go so far as to pay their pilots a virtual salary, none were actually tracking their profits and losses in a real world manner indicative of the costs of operating a real airline. The "MetroAir Financial Schema" was created to fill this void. All calculated income and expenses are tracked with the possibility that errors in route planning, aircraft acquisition along with volatile fuel costs and seasonal variations in demand could result in net losses and even bankruptcy for the airline.



METROAIR MAINLINE ROUTE MAP

The MetroAir difference

MAV began with the common premise of other VAs; downloadable aircraft to fly, routes to fly them on, and the ability to log completed flights and accumulate flight hours. Where they begin to explore new ground was that MAV utilized a financial perspective from the outset. There was an initial capitalization figure of $50,000,000.00 for startup costs. A major upfront expense was aircraft acquisition…airplanes do not magically appear on the flight line for use. Instead, MAV management examines what real world aircraft are on the market and within their budget. As an example; they recently acquired 5 B767-233 aircraft. These were selected from 7 aircraft currently being stored in the Mojave Desert. The purchase price reflected the actual condition of the aircraft, resulting in 3 being placed into immediate service while 2 were held back to undergo necessary heavy maintenance (and the attendant cost of same) prior to service entry. As a direct reflection of its status as a startup airline with limited cash resources, the airplanes obtained tend to be older, more affordable (but less efficient than newer) with an eye toward establishing service with them and then upgrading if and when they generate sufficient income to support such purchases.

Routes are chosen based on a mathematical formula that takes into consideration FAA data on such factors as existing competition, delays, passenger counts as well as population densities of the cities served and the operating data of the aircraft being used. This generates anticipated relative profitability on each route and is incorporated with the Financial Schema to produce real numbers that translate into profit or loss.

At the time of this article, MAV was scheduling 154 flights to 42 destinations from its hub at KDTW utilizing DHC-8, 737-200, 737-700 and 767-200 aircraft.

MetroAir operates on the premise that flights are operated, whether by a member pilot, or automatically. Piloted flights are awarded a higher revenue percentage than automatic flights as an incentive for pilots to increase airline earnings. This resulted in October 2006 income of over $327,000 being generated by 97 pilots flying 394 flights; which reflected a 50% increase in activity from the previous month.

A monthly financial statement is published detailing revenue and expense for the previous month and the fiscal year. The workhorse of the fleet is the 737-200 which accounts for half of all income. The single largest expense item is fuel, which combined with labor costs, amounts to nearly half of the expenses. The financial results reflected a loss of $6.46 million for October, 2006 and a net yearly loss of $4.0 million. These figures are an accurate portrayal of expected revenue and expense for a smaller startup airline and show that the schema devised by MAV management to compute their operations is quite reliable.

While there is no appreciable difference in the physical operation of flying aircraft between one VA or any other, MAV brings a new dimension to the experience and allows pilots to contribute to an actual bottom line for their airline. It is this vested interest in the VA that just might make a pilot to be that much more discerning in deciding how much fuel to carry on a given flight as he realizes there is an actual cost involved in the equation.

No airline commences operations with the intention of failing but commercial flight is a tough business and success is by no means assured. MAV replicates the uncertainty of this reality as it strives to evolve a prosperous business model. ✈

ARMY
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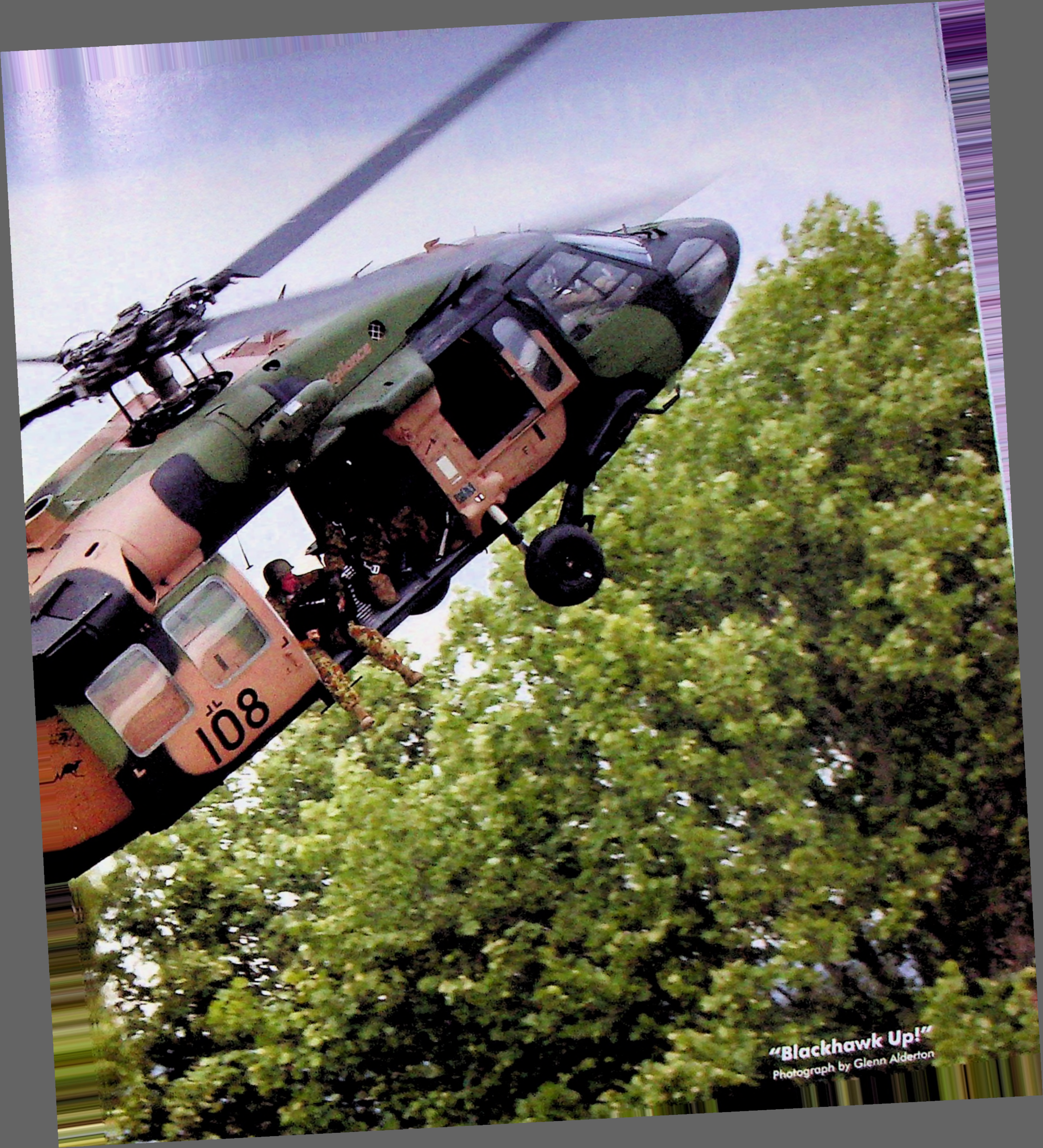

"Blackhawk Up!"

Photograph by Glenn Alderton

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Lots of Raves. Rants to Follow.

Response to New Microsoft Flight Simulator Is Predicable

BY BILL STACK

Everyone who's been using Microsoft Flight Simulator® for the last 15 years knows the routine. A lot of hoopla surrounds impending releases of new versions, then a cargo hold of rants follows after flight simmers start using the new product. It's that same old love/hate relationship that simmers have with Microsoft.

"Flight Simulator X [version 10] is the culmination of nearly 25 years of the landmark Flight Simulator franchise and the most significant addition to date," heralds one website with the glee of a five-year-old at his birthday party. "The 10th addition to the highly successful 'Flight Simulator' franchise, this newest addition will immerse players in a beautifully rich and realistic world, offering a completely new and innovative gaming experience with dozens of new aircraft to choose from."

Later, after the new version has been on the market for a while and we hear from users who paid for the product, we'll compare user rants to reviewer raves.

Is this release really the most significant addition to date as claimed? It would have to be more significant than the addition of real-world weather and air traffic control. We'll see if this statement isn't a flight bag full of hyperbole.

"A beautifully rich and realistic world" is the sort of description we've heard upon release of every version. This begs the question: If the last version was "as real as it gets," than how can the new version be more realistic? This question has never been answered. It's a dirty secret of flight simming.

"A completely new and innovative gaming experience," as one reviewer wrote, is either obvious hyperbole or obvious naiveté. Only the first version was completely new and innovative because there were no others prior to its introduction. Although the 10th version is indisputably better than all previous versions, none of its improvements make it "completely new and innovative."

Here are facts about Flight Simulator 10:

It is being released in two editions: Standard and Deluxe. The standard edition has 18 airplanes, 40 highly detailed airports with 16 of them new to the MSFS, 28 highly detailed cities, and 30 structured missions.

The Deluxe version has 24 airplanes, 45 highly detailed airports with 21 of them new to MSFS, 38 highly detailed cities, 50 structured missions, the new Garmin G1000 in three cockpits, and a software development kit, commonly referred to as "SDK."

Both versions offer an updated sound package with dual speaker-headset capability. Simmers will be able to hear radio operations through their headsets while hearing engine and wind sounds from their speakers, which more realistically simulates a cockpit environment. I'll keep my ears perked for that improvement!

Both versions have moving cars and trucks on the roadways, wild animals running amok, and rivets on the aircraft. My opinion of such minute detail is well known: If ground objects can't be seen from aloft, they're useless. And although rivets are important for holding real aircraft together, they add nothing to my flight simming experience.

Indeed, the cars and trucks moving on roads and the boats and ships moving on water are fascinating from aloft. Service vehicles moving about the airport movement areas is a good touch for when we're taxiing about, and wild animals interfering with taxiing and take-off add to realism, especially at remote fields. But rivets on aircraft are not riveting to me.

"There's no denying that this will be one of the best looking PC games ever released," opines another reviewer. He's impressed by reflections off the windows from exterior views and colors changes depending on the angle the fuselage is viewed from. Well, so am I, but I'm more interested in how realistic the terrain and weather appear from aloft and how the aircraft fly.

Every reviewer I ever read, regardless of who he was and what he reviewed, was impressed whenever there was more of anything. True to form, all reviewers of FS 10 are impressed by more aircraft.

As a professional writer and writing trainer with an undergraduate degree in English, I'm always attuned to ambiguities such as "approximately 24 real-life aircraft." Counting such a small number of aircraft isn't difficult or time consuming. Are there 23, 24, 25 or what? For any reviewer worth his keyboard, the MSFS website specifies 18 new aircraft for the standard edition and 24 for the deluxe edition. Such carelessness as "approximately" in this case should make anybody doubt the accuracy of everything else the reviewer writes.

Being more pragmatic than these enthralled reviewers, I would like to see more types of aircraft rather than more aircraft of the same type. So adding an Airbus that's similar to a Boeing 737 doesn't do as much for me as adding a regional jet, which FS10 has done.

Removing most of the historic aircraft from FSX is okay with me because I rarely flew them anyway. We'll learn soon enough how many simmers miss them, but they will be history by then.

I never spent much time in the gliders, either, but they did seem rather absurd flying around without the benefit of tow planes. It was like flying an airline without being searched. Not to worry any more: FS10 includes a glider tow plane with accurate tension modeling for realism.

One reviewer seems to have no knowledge of prior MSFS versions. He's so impressed by "structured gameplay" that he calls it "one of the biggest changes." He writes: "The previous games merely gave you a huge world to explore and fly around, but many gamers felt like they would be better served with some sort of direction. With that in mind, the team designed a number of missions, including point-to-point objectives and skill-based flying."

Was I hallucinating when I saw adventures and lessons in MSFS2004? No, they were definitely there when I checked this morning. They aren't called "missions," but they serve the same purpose. Are we supposed to take such a poorly informed reviewer seriously?

Here are some good improvements, in my opinion: more realistic terrain than ever, smooth transitions from area to area, realistic stars, surround sound to make engines sound more realistic, authentic road layouts enabling us to navigate by the streets below (real world VFR pilots actually do that, which might surprise IFR-obsessed simmers).

One major weakness in FS2004's weather was the loss of instrument meteorological conditions after departing an airport, even with real-world weather updated frequently. Seeing terrain enroute ruined the entire IFR experience. I would consider the new version worth the entire investment if this alone was improved.

A marvelous multiplayer feature in the deluxe version enables one player to simulate air traffic control for other players who are simulating flight.

Another welcome new feature is the slight movement of the interior view in the virtual cockpits to simulate movement of occupants whenever the aircraft changes bank or pitch. It really helps with simulating spatial orientation, especially when flying in low or zero visibility.

A criticism I have always had with MSFS's "upgrades" is the changing of how the program operates. For example, every new version has had a different method of changing views out the windows, and this version has followed suit. Why, I ask?

Now for the bad news: The new Windows Vista operating system is needed for best performance (code words are "optimized for Vista"). Although Microsoft assures that Vista is not required, every flight simmer who has been through an MSFS upgrade has reason to doubt this assurance. Prior versions always worked acceptably on lesser operating systems, but not well enough. Upgraded systems have always been needed for full enjoyment of new MSFS releases. Upgrading to Vista will not be inexpensive. The retail cost of this new operating system for home users is about $200 US!

Whether Vista is or isn't required remains to be seen, but a DVD reader is indisputably requisite. Microsoft says the new version will ship only on DVD "to provide the highest level of detail and realism for the product." A reviewer opines that releasing only on DVD enabled Microsoft to make everything "up to 16 times more detailed." But hidden in this "advantage" is the usual hardware upgrade. Gamers without a DVD drive will not be able to install FS10. Sorry, guys.

DVD drives range in price from US$30 to $US200, depending on quality and features. Take this advice from someone who learned the hard way long ago: Invest in quality equipment and don't waste your money on cheap stuff.

I'm eagerly flying FS10 to see how true the press releases and reviews are. Then I want to read what buyers think about the new product. Send me a note, please.

Bill Stack is an expert flight simmer, a management consultant and a professional writer, speaker and trainer based in Knoxville, Tennessee, USA. He has authored several books and numerous articles about flight simming. His books are available from quality flight sim suppliers such as PC Aviator at www.pcaviator.com, and he can be contacted at fsbooks@topskills.com ✈

Microsoft Flight Simulator X

Master the Experience - Book Review

BY DEAN BIELANOWSKI

Game and strategy guides are often very good sellers for book publishers keen to cash in on the literary side of the growing PC/Mac and console gaming market. A game guide is often the place to search for those interesting tidbits of information you don't find in the original software's included manuals...

It has been a similar story in the past for the Microsoft Flight Simulator line of titles. There have been numerous publisher's producing game guides over the years for each successive version release. Sybex published the official game guide for Flight Simulator 2004. For Flight Simulator X, Prima Games has published the officially-endorsed guide.

The 270+ page softcover book is written by Bart G. Farkas. I haven't heard the name around the flight simming world before, but I would assume the writer is a keen simmer with a good knowledge and background of the simulator series. It would appear so as a photograph of his elaborate sim setup is shown on page 8. Perhaps you might have heard of the writer yourself? The book is printed in full color throughout with sufficiently large, easy to read text, so those with a visual impairment need not fear. In saying that, however, the text is not so large that it looks like a children's story book – about font size 12 is my guess.

So what will you find in this book?

Well, to begin with, adjacent to the inside front cover of the book is a removable quick reference hotkey card. You know, one of those cards that have a lot of simulator keyboard shortcuts printed on it… I actually love these. They provide a quick reference to common keyboard controls, saving you having to go into the controls section of FSX to hunt down that elusive keyboard combination. The list doesn't appear to be the complete set of keyboard shortcuts available in the sim however. A quick glance over and I noticed a few of the more obscure shortcuts here and there are not printed. It does cover all the basic flight options and commands and is a useful inclusion in the publication. Extract it from the book and keep it handy during your sim sessions. You will refer to it a lot, particularly if you are new to Microsoft Flight Simulator.

The content of the book itself is divided into 12 major sections, these being (in order):

- **Flight Simulator X: The Basics**
- **Getting Help: The Learning Center**
- **Fixed-Wing Flight**
- **Rotary-Wing Aircraft**
- **Navigation**
- **Flight Concepts and Jargon**
- **Aircraft**
- **Free Flight: Seeing the World**
- **Missions**
- **Emergencies**
- **Playing Well with Others: Multiplayer**
- **Appendix**

It is a little tricky to sort out where one chapter or section ends and another starts, but there is a detailed table of contents to allow you to find specific information you need quickly and easily.

In the Flight Simulator X: The Basics section, the author provides a brief overview of setting up your simulator, including small sections on graphics, sound and controllers. It seems to be written more as a quick-start feature to make you aware of what is in the sim and how to access certain features or controls you will use the most. If you are familiar with the Flight Simulator series, you can probably skip this section altogether, although it is worth a read if you are not sure what setup switches do what!

In *Getting Help: The Learning Center* Bart looks at perhaps the most valuable, but most underutilized section of the Flight Simulator software – the Learning Center. While the book only scratches the surface of what you will find in the Learning Center itself, I think the author has issued it enough text space to at least make you aware of its existence, and how valuable a resource it really is.

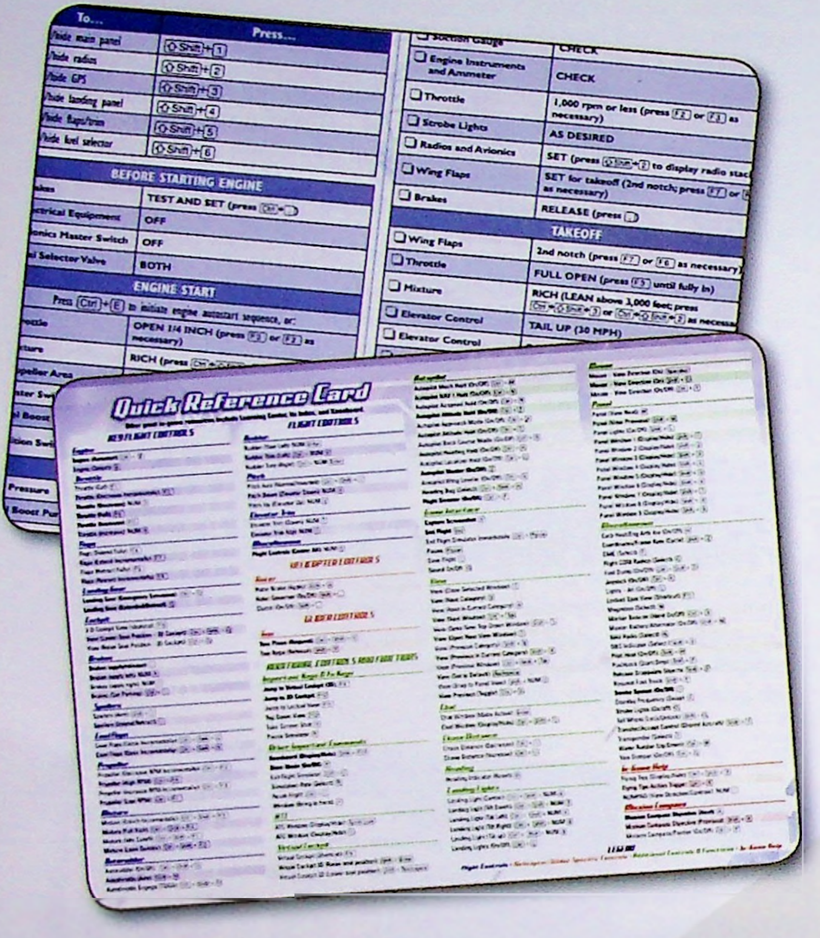
Fixed-Wing Flight starts to get into the nitty gritty of actual flying. It will provide a beginning pilot with useful information about key cockpit instrumentation, a simulated learning path for various types of flight, as well as rudimentary information for takeoffs and landings, including V speeds. Advanced pilots will likely know all of this already.

The section on *Rotary-Wing Aircraft* offers up some useful information to get you airborne in the helicopters, and to keep you there! The vast majority of flight simmers are a little timid when it comes to flying the choppers. If that's you, a read of this section might calm your nerves enough to give it a try. And remember, in the sim, if you crash, you get a second chance… and a third chance, and a fourth, and fifth, and sixth….

Navigation again offers an introduction to the various types of navigation options available to the pilot. From VORs to the GPS, the section will provide an overview of each, but falls short of actually going into detail of any of the types, rather, referring you to the Learning Center section for each. Of course, you will find the best navigation and sim lessons in this very publication - Computer Pilot Magazine (shameless plug, I know).

The next section in the book looks at *Flight Concepts and Jargon* and this section does offer a solid stack of information for pilots of all skill levels. There are common acronyms, explanations of terms such as Icing, Pitot Ice, G-Force, Slew, Scud-Running, Wake Turbulence, Stalls and Crabbing, among others. A useful primer for a beginner, or a refresher for the more advanced.

The *Aircraft* pages look at each of the default aircraft included in the Flight Simulator X package. It cites both the history of each aircraft and its current day usage, as well as provides aircraft specifications and vital performance data and speeds to reference during a flight. The section is illustrated with some nice panel graphics and screenshots of the actual simulator model.



To...	Press...
hide main panel	Shift+1
hide radios	Shift+2
hide GPS	Shift+3
hide landing panel	Shift+4
hide flaps/trim	Shift+5
hide fuel selector	Shift+6

BEFORE STARTING ENGINE

akes	TEST AND SET (press Ctrl+.
ctrical Equipment	OFF
onics Master Switch	OFF
l Selector Valve	BOTH

ENGINE START

Press Ctrl+E to initiate engine autostart sequence, or:

ottle	OPEN 1/4 INCH (press F3 or F2 as necessary)
ture	RICH (press Ctrl+

☐ Suction Gauge	CHECK
☐ Engine Instruments and Ammeter	CHECK
☐ Throttle	1,000 rpm or less (press F2 or F3 as necessary)
☐ Strobe Lights	AS DESIRED
☐ Radios and Avionics	SET (press Shift+2 to display radio stac
☐ Wing Flaps	SET for takeoff (2nd notch; press F7 or
☐ Brakes	RELEASE (press .)

TAKEOFF

☐ Wing Flaps	2nd notch (press F7 or F6 as necessary)
☐ Throttle	FULL OPEN (press F3 until fully in)
☐ Mixture	RICH (LEAN above 3,000 feet; press Ctrl+Shift+3 or Ctrl+Shift+2 as necess
☐ Elevator Control	TAIL UP (30 MPH)
☐ Elevator Control	

Quick Reference Card

FLIGHT CONTROLS

This was one of the most interesting sections of the book for me as you not only learn about the technical aspects of each aircraft, but its place in history as well.

Free Flight: Seeing the World – Here you are shown how to set up a free flight utilizing weather and how to work your way around the inbuilt Flight Planner module. The section then continues on to highlight some tourist attractions around the world then offers a list of other notable and interesting places to visit, although this latter list does not include lat/lon co-ordinates to make things easier, so you have to find them yourself – could be half the fun? I would have liked to see some recommended flying trips here, like Round Robins, but then that might not be classified as "Free Flight"?

Within the *Missions section, we* are introduced to one of the biggest new "features" of Flight Simulator X. Some have argued the mission module makes Flight Sim more of a game, but I disagree. The Missions are great fun and urge you to take flight beyond any previous limits you may have flown under. There are some great adventures requiring tasks that would even challenge the best flight sim pilot. The book explores each of the included missions in the simulator by giving a brief description of the mission along with a small notes section. A lot of the information seems to be similar to the text included with each mission's briefing in the sim, so I was hoping for a little more here. Perhaps a few technical notes other than a generalization of the flight would have been more in-line with a book sub-titled as "Mastering the Experience".

Emergency! Emergency! If you are looking for some excitement, or perhaps have a virtual death wish, then the *Emergencies* section of the book is the place to get your adrenalin fix. The author sets up numerous scenarios where he outlines specific aircraft failures to occur (teaches you how to use the Failures module of FSX in the process) in specific aircraft, at specific times, using a specific location. In other words, you are being set up for certain doom! Sounds a little unnerving to me! The emergencies cover most of the default aircraft and the author has kindly suggested a few strategies with each scenario to offer you a little glimmer of hope. It is then up to you to utilize the remaining operational systems of your aircraft to save yourself, your passengers and your aircraft! There is a lot of fun to be had here.

Playing Well with Others: Multiplayer – Many simmers never ever venture out into the wide world of online flying. They are missing out! Flying online with others adds a whole new dimension to the product. Perhaps as soon as someone mentions the word "Network" or "Online Conection" it scares people off? This need not be the case. In this section the author takes you step-by-step through the connection process with plenty of associated screenshots to go with the text instructions. You will learn how to host a session, join an existing session, how to share an aircraft over a network or internet connection (new feature of FSX), set up real-time Air Traffic Control (another new FSX feature) and much more. There are plenty of suggestions on how to enjoy the online experience as well, like hosting "Air Rallies", playing "Kamikaze Tag", or the old favorite, "Follow the Leader".

The book concludes with the Appedix section, which is essentially a heap of printed checklists for each stage of flight for the included default aircraft in Flight Simulator X. A handy reference indeed.

Overall Impression

The book itself is nicely presented and well laid out. It is easy to read and instructions seem easy to follow. The included graphics and screenshots are nice, although you will come across a few very pixelated screenshots that look rather horrid, but luckily these form the minority of the graphical content.

Overall, I'd have to say this book is best suited to new Flight Simulator X users… i.e. those that haven't used any of the previous versions of the Flight Simulator software. In some sections the detail will fail to impress the more experienced. In contrast, there are other interesting sections that will appeal to pilots of all levels. The book is well-priced at just US$19.95, which is up to 60% cheaper than some other official game guides and manuals. It's well worth buying the book if you are new to the flight simulation genre as you will pick up a lot of the basics you will need to get around the sim software and use it to its maximum potential.

Flight Simulator X: Master the Experience is available from all good flight simulator retailers and computer-related bookstores worldwide. ✈

Subject: December 2006 Issue and Should I buy FSX?

Obviously FSX is a graphics hog and memory intensive (duh-yeah, I know). It would've been very helpful to me if that article would've come out more specific about hardware requirements. To say that it depends on OUR knowledge of OUR systems is simply not enough because more than a few of us don't know a megabyte from a dog bite okay? It would've been a lot more constructive to me if there had been something in there like if you have THIS AMOUNT OF MEMORY on your GRAPHICS CARD and this how you find out, forget it, you're hopelessly outclassed. And this BEFORE I spent the money. And maybe a teaser in earlier issues of CP warning that an article like this was on its way.

Yes, FSX offers a lot of really wiz-bang gee-wiz graphics and stuff. Fine. But what's the point of having all that stuff if in order to run FSX at all, one must set all the sliders and controls to low or very low? For goodness sake, it was like watching a really bad 8mm home movie or worse. I like to fly out of Sky Harbor in Phoenix, AZ (KPHX) to all points. But with the display set so that the flow is smooth, I see no interactive or dynamic scenery, no buildings including the really cool fuel trucks, luggage tractors or moving access ramps(whatever those tunnel widgets are called), just a lot of desert-lots and lots of desert.

Because I am your average blue-collar, long-haul trucker type - read underpaid and overworked, I do not have the latest in warped drive, singularity driven, hyper-powered machines and unless (God willing) I am blessed to win the lottery, will probably never have a machine like that. Heck (insert stronger expletive here), it took me years to finally acquire a laptop capable of running FS2004 at max (finally!). But the 128Mb card I have(and I had to call HP customer support to learn how to use that DirectX trouble shooter to learn that I had 128Mb on my graphics card) goes on strike with FSX. Lucky for me I kept FS2004 and re-installed it along with 50 or so add-on freeware and payware aircraft, scenery enhancements, and my Jeppesen charts. I relegated FSX to the top of one my storage cabinets in the hopes that the almighty will take pity on me and drop a brand-new machine on me somewhere on I-80 in Wyoming or maybe Nevada. Whatever works.

These are my meandering thoughts on the subject and probably, just as much helpful and insightful as Mr. Dumas' article.

With all due respect,

Mark West

"Mark West"
WINS 12 MONTH COMPUTER PILOT SUBSCRIPTION/EXTENSION!

[Hi Mark – Thanks for your letter. This is always a touchy subject. I'm not going to say what is right or wrong with any particular article. The purpose of the article was not to give specifics per say, but to get you thinking about what you desire in a flight simulation program. Everyone is different. Some people want the best they can get, and as a consequence, they need to have the best system to run it, others are happy to sacrifice a lot of visual detail in order to attain smooth frame rates and to utilize other non-graphic portions of the new version. When FS2000 and FS2004 were first released, much of the same comments as yours floated around the place. Microsoft makes software to run optimally on high speed systems that are not even invented yet! Three years after FS2004 was released, we are only now seeing systems that can run it at full spec with all the latest resource-hogging add-ons thrown in as well. I expect this to be the same with FSX. Perhaps we didn't make that clear enough in our FSX-related articles. But hang in there. When time comes to upgrade your system, you will probably find it has enough oomph to handle FSX at your desired level. In the meantime, there are numerous guides around the internet for maximizing FSX performance. Some options work very well indeed and should be investigated.

For a quick and dirty FSX FAQ, check out www.pcaviatornetwork.com/FSXFAQ.htm where you can find answers to common FSX problems as well as links to performance enhancing articles online. For those lucky enough to have the latest u-beaut systems, FSX does run quite well on these systems, and I have heard of many simmers with even average systems (under 2Ghz) achieving good results (albeit with a few less graphics). Laptop computers are rarely as fast as what a desktop computer can render flight sims, due mainly to the lower end video cards and less RAM found in these systems. You would need a very expensive laptop to run FSX well, and it would likely cost three times more than a comparable desktop system! - Ed].

Write To *Computer Pilot INBOX*

If you have something you want to share with fellow flight simulator enthusiasts, then Computer Pilot INBOX is the place to be heard. Each issue, we'll choose the best letter as the letter of the month and reward that reader with a prize!
The easiest and quickest way to submit your letters is by e-mail to: inbox@computerpilot.com

Importing Aircraft into FSX - Part I

BY DR. DAVID WILSON-OKAMURA

The new version of Microsoft Flight Simulator, FSX, has been available in stores now for almost three months. In that time, there's been a lot of discussion about what improvements were made over the previous version (FS9), what improvements weren't made, and especially how to improve framerates. One thing everyone seems to agree on: the default aircraft are much improved. Except the Mooney and King Air, all the old visual models got a makeover. Cockpits, in particular, look much cleaner and more detailed. The new aircraft are winners, too. Out of the box, Flight Simulator now includes for the first time an Airbus, a Canadair Regional Jet, a couple of Maules, a De Havilland Beaver, and a Grumman Goose. But there have been some deletions, too. For instance, all of the vintage aircraft that were introduced in FS2004: A Century of Flight are gone now, except the Douglas DC-3 and Piper Cub. Also missing are all of the freeware and payware aircraft that we've purchased or downloaded. Some of those aircraft, such as the PMDG B737 or Level D 767, will have to be remade; an upgrade won't do it. Many, though, of our old favorites can be converted to FSX. In this two-part article, we'll discuss the techniques and give some examples.

General Guidelines

For payware aircraft, the first thing to check is the publisher's website and support forum. Some publishers have issued free programs that will update your existing FS9 aircraft for FSX automatically. If that's the case for your aircraft, get the update, run it, and you're done. But what if there is no update from the publisher?

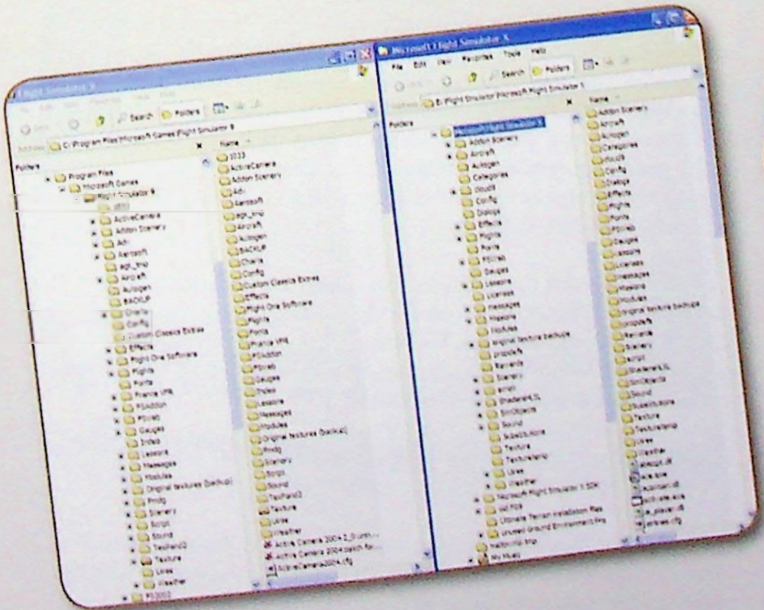
In many cases we can do the update ourselves. Let me start with some general guidelines.

1. If you have FS9, don't uninstall it for at least one year. Even if you stop actually flying the old version (which many people won't right away), there are files there that will come in handy later. Which ones? We're not sure: that's why we're keeping FS9.
2. Be patient and work slowly. If you've just installed FSX, enjoy the new aircraft and see what they have to offer. Get a feel for the new view system. Then, when you're ready to start moving aircraft, do them one at a time. The old proverb is a good one: "Measure twice, cut once."
3. Work on a copy. Don't edit your FS9 planes, edit the copies of them you make for FSX. That way, if something goes wrong, your FS9 version still works and you can start over.
4. Think of this—converting aircraft for the new sim—as a hobby rather than a chore. It's not unlike building a model railroad in your basement: just because the train isn't running all the time doesn't mean you aren't enjoying yourself. Running the train is fun—and so is building the model, choosing the various cars, painting them if need be, placing the signs and greenery.

Basic Tools

In addition to FSX (and, if you have it, FS9), there are only two or three tools that you need and they all come with Microsoft Windows. They are:

1. Notepad, to edit configuration files.
2. Windows Explorer, to copy files.
3. Some kind of image editing software, to create thumbnails. I use Photoshop, but you can use whatever software that came with your computer. All you need is something that can reduce and crop.



TWO COPIES OF WINDOWS EXPLORER

In what follows, I will assume that you understand the basics of each program. One tip: since we'll be using Windows Explorer a lot, learn the keyboard shortcut: it's the Windows Key (with the flag on it) plus the letter e (for Explorer). For copying files from FS9 to FSX, I find it useful to have two copies of Windows Explorer running at one time: one open to my FS9 folder (or a zip file, if I'm installing a new aircraft), the other to FSX.

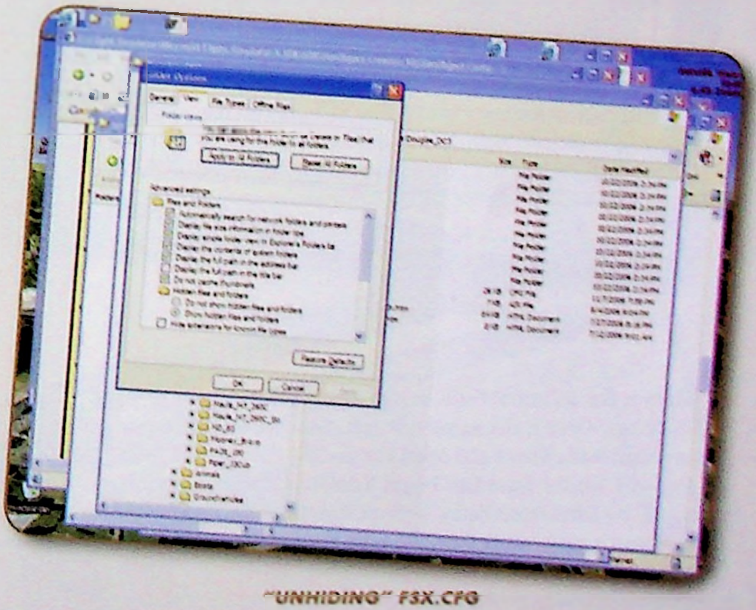
Basic File and Folder Locations

Almost all of the files we are going to be working with are in two folders:

C:\Program Files\Microsoft Games\Flight Simulator 9
C:\Program Files\Microsoft Games\Microsoft Flight Simulator X

This might be different if you installed Flight Simulator in some place other than the default. (On my computer, FSX is on the E: drive, so if you see that in a screenshot, don't let it bother you.) From brevity's sake, I will be calling the first folder "your FS9 folder" and the second folder "your FSX folder."

There is one more file that we need to deal with, fsx.cfg. While well-known to tweakers, this can be tricky to find, because it's hidden by default. We'll need to fix that. In Windows Explorer, select "Tools" then "Folder Options" from the main pulldown menu. Now select the "View" tab and under "Hidden Files and Folders," make sure that "Show Hidden Files and Folders" is checked. Otherwise you won't be able to see fsx.cfg, even if you are looking in the right place.



"UNHIDING" FSX.CFG

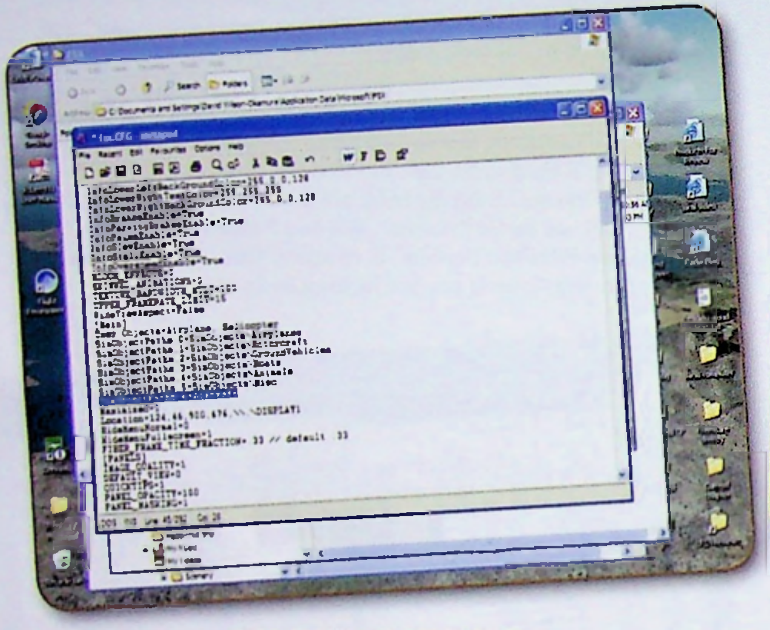
Now, again using Windows Explorer, navigate to the following subfolder: "C:\Documents and Settings\Username\Application Data\Microsoft\FSX" where Username is your Windows user name. You should see a list of several files, including fsx.cfg. If you're still having trouble, you can find fsx.cfg using Windows file search (keyboard shortcut Windows Key + f). My advice, once you've found fsx.cfg, is to pause for a moment and create a desktop shortcut so that you can access it easily in the future.

We now have our tools and we know where our materials are. There's one more preliminary step.

Adding an "Aircraft" Folder

As soon as the FSX demo became available for download, tweakers wanted to know, "Where's the Aircraft folder?" In FS9, Aircraft was a subfolder of the main FS9 folder and contained all types of vehicles, including airplanes, helicopters, boats, and ground vehicles. In FSX, a boat doesn't go in the Aircraft folder; it goes in the SimObjects folder, under Boats. That's logical, but we're trying to move FS9 aircraft over to FSX, so where do we put them?

We could put them in the Airplanes subfolder of SimObjects, which is where FSX puts most of its default aircraft, except, of course, the helicopters: those are filed, logically, under Rotorcraft. This works fine for most aircraft, but some FS9 payware aircraft come with configuration programs that expect aircraft to be in the "Aircraft" folder, not the "Airplanes" subfolder of "SimObjects" (neither of which existed in FS9).



NEW "AIRCRAFT" SIMOBJECT

Here is the solution. First, create a new folder inside of your FSX folder. Give it the name Aircraft. Second, start Notepad (or an equivalent text editor) and open the fsx.cfg file that we found earlier. Now, look for the lines that begin SimObjectPaths. On most systems, this will be SimObjectPaths.5=SimObjects\Misc. Found it? After this line, insert a new, blank line and type the following:

```
SimObjectPaths.6=Aircraft
```

If there's already a SimObjectPaths.6, then use the next available number instead of 6. Save fsx.cfg and we're done.

Now we're ready to convert some aircraft. In this article, we'll consider three different starting points: an aircraft that's already installed in FS9, a downloaded zip file, and an aircraft that comes with an installer program.

An Aircraft That's Already Installed in FS9

Let's begin simple, with the default Lockheed Vega from FS9. Even if you never flew this plane in FS9, it will be useful in part two when we replace old gauges.

Don't start FSX yet. Instead, start Windows Explorer and open your FS9 folder. Go to the Aircraft folder and find the subfolder named Lockheed_Vega. Right-click on Lockheed_Vega and select "Copy." (You can do the same thing by selecting Lockheed_Vega with the mouse and pressing control+c on the keyboard.) The whole aircraft, including all of its subfolders, is now on the Windows clipboard. Now, start a second copy of Windows Explorer and open your FSX folder. Select the Aircraft folder we created earlier, right-click with the mouse, and select "Paste." (Be careful about dragging folders with the mouse: we want to copy the folder, not move it.) You should now have a copy of the Lockheed_Vega folder inside your FSX Aircraft folder.

That's it! Start FSX, and you can now select the Lockheed Vega as your aircraft. At this stage, the aircraft is completely flyable.

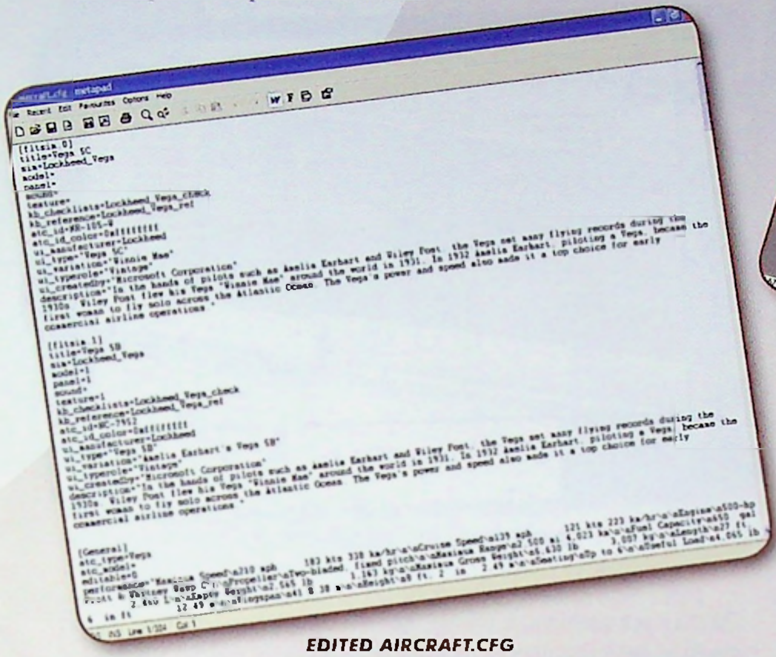
VEGA SUCCESSFULLY INSTALLED IN FSX

There's a couple things missing, though. First, if we sort aircraft by publisher (something that wasn't possible in FS9), the Vega isn't going to be listed as a Microsoft plane. Second, we don't see a picture of the Vega until after you've already selected it: where the default FSX aircraft have a nice thumbnail picture of the plane, the Vega has only a generic grey question mark. The bad news is this is going to happen with every aircraft we transfer from FS9. The good news is both things are easy to fix.

First, we'll insert the publisher info. Open the Lockheed_Vega folder (under Aircraft) and look for the file aircraft.cfg. Open that file in Notepad and look for [fltsim.0]. Keep reading. After ui_variation="Winnie Mae" we are going to insert a couple of blank lines, in which we'll type the following:

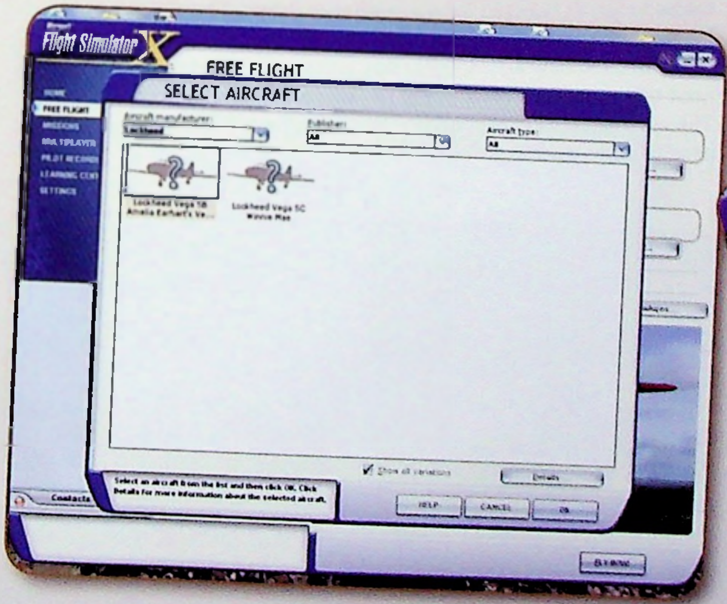
```
ui_typerole="Vintage"
ui_createdby="Microsoft Corporation"
```

For the first line, typerole, you can use whatever category you like; since I'm interested in vintage aircraft, I decided to create a "Vintage" category. Now, we need to insert these lines for each paintjob or livery. So, keep scrolling down until you see [fltsim.1]. That marks the beginning of the second livery definition. (Notice that the numbering starts with 0 not 1). Look for the line that begins ui_variation and after that line insert the same ui_typerole and ui_createdby lines that we used for the first livery. We will need to do this for each livery. (The Vega has only two.) When you're finished, save aircraft.cfg and exit Notepad. That problem is licked.



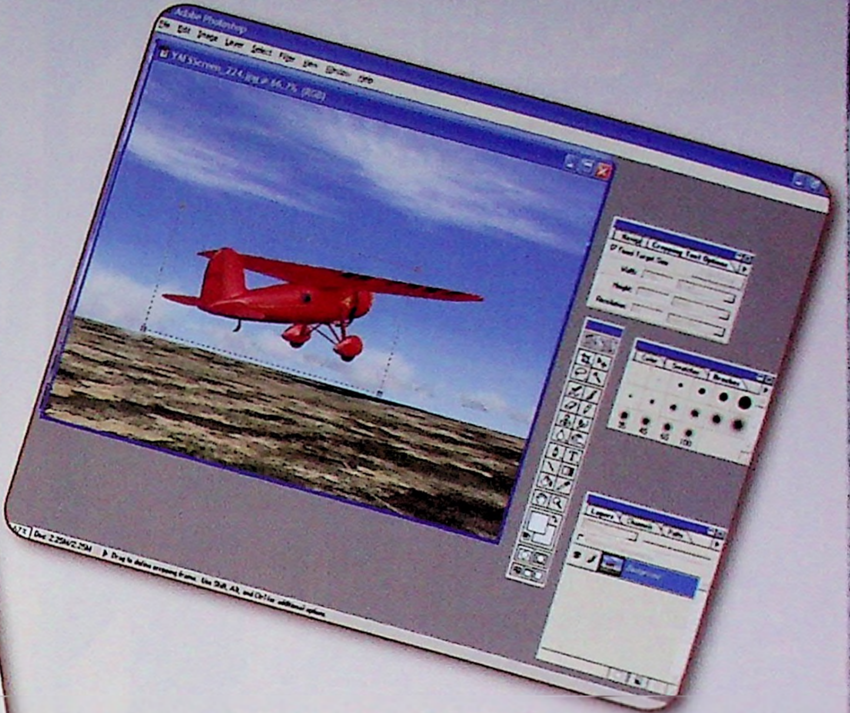
EDITED AIRCRAFT.CFG

Second, we'll add some thumbnail images. You'll need a screenshot of the Vega in action, preferably one for each of its two liveries. (If you don't have one for each livery, you can either make the screenshots now or use the same screenshot for each one.)


Flight Simulator X
FREE FLIGHT
SELECT AIRCRAFT
Lockheed Vega 5B Amelia Earhart's Ve...
Lockheed Vega 5C Winnie Mae
HELP
CANCEL
OK

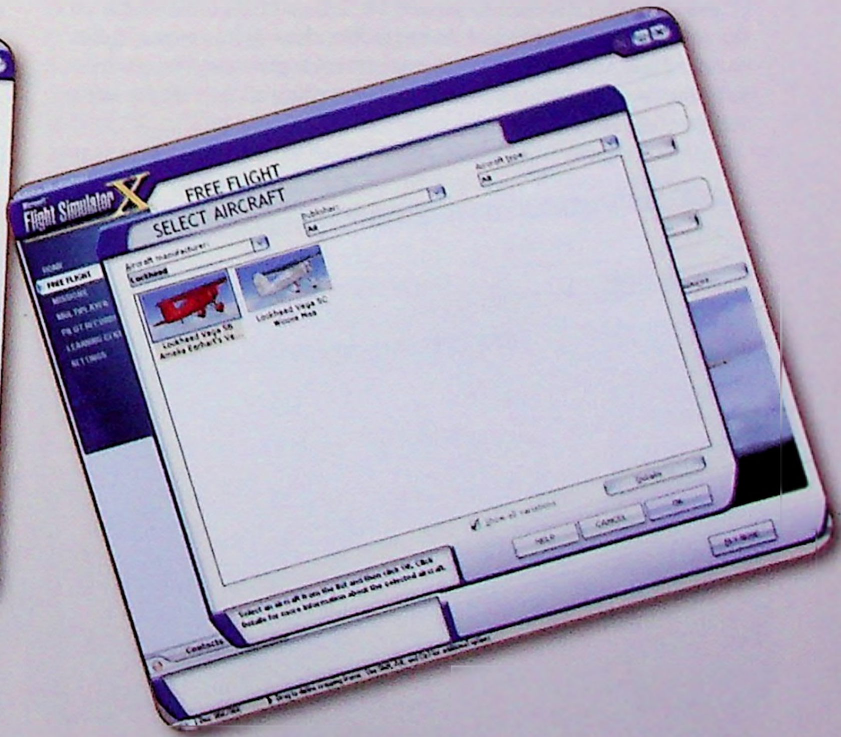
QUESTION MARKS

In your photo editing software, crop the first screenshot so that it's 256 pixels wide and 128 pixels high. Save this cropped screenshot in JPEG format using the filename thumbnail.jpg.



CROP SCREENSHOT TO 256X128

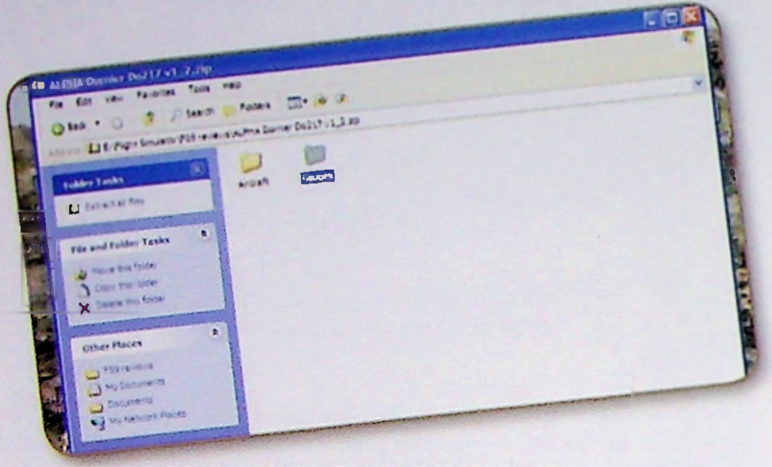
Where do we save it? Every aircraft has one or more texture subfolders, one for each livery. Our goal is to save the new thumbnail.jpg file in the texture folder that matches the livery in the screenshot. Some texture folders have names (such as texture.blue or texture.army); others, such as the Vega, just have numbers (texture.1, texture.2). If we guess the wrong folder, that's all right: we'll just move the file to another texture folder until the thumbnail matches the actual livery. (The aircraft.cfg file will usually provide some clues.) Then we'll do the same thing for each of the other liveries: crop a screenshot to 256 by 128 and save it as a JPEG in that livery's texture folder, using the standard filename thumbnail.jpg.


Flight Simulator X
FREE FLIGHT
SELECT AIRCRAFT
Lockheed Vega 5B Amelia Earhart's Ve...
Lockheed Vega 5C Winnie Mae

THUMBNAILS INSTEAD OF QUESTION MARKS

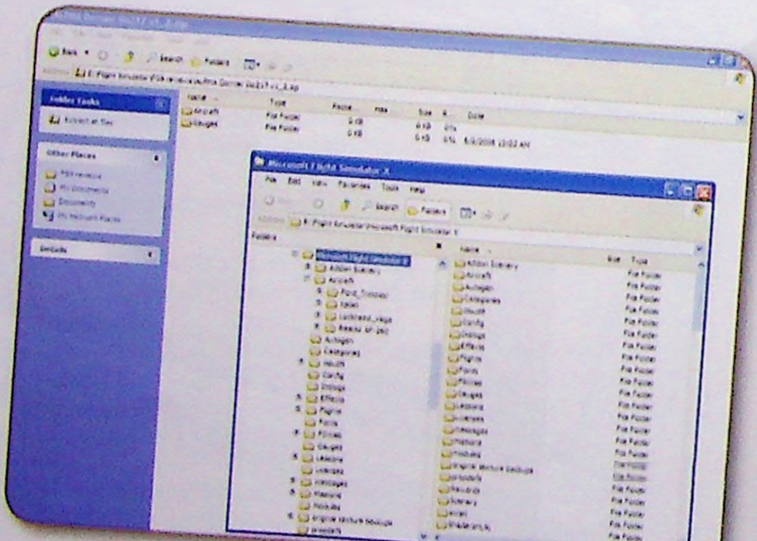
Installing Aircraft from a Zip File

The standard freeware aircraft comes in the form of a downloaded zip file, which contains an Aircraft folder and possibly a Gauges folder. (Some publishers release payware aircraft in the same way; Alphasim is an example.) In FS9, you install the aircraft by copying both folders into your main FS9 folder: Aircraft contents go into FS9's Aircraft folder, and Gauges contents go into FS9's Gauges folder. Sometimes, instead of an Aircraft folder, the zip file will contain a folder with the name of the aircraft, such as LICEagle_II or HCJayhawk_cz; these folders should be copied inside of the main Aircraft folder, where they will join your fleet of previously installed aircraft.



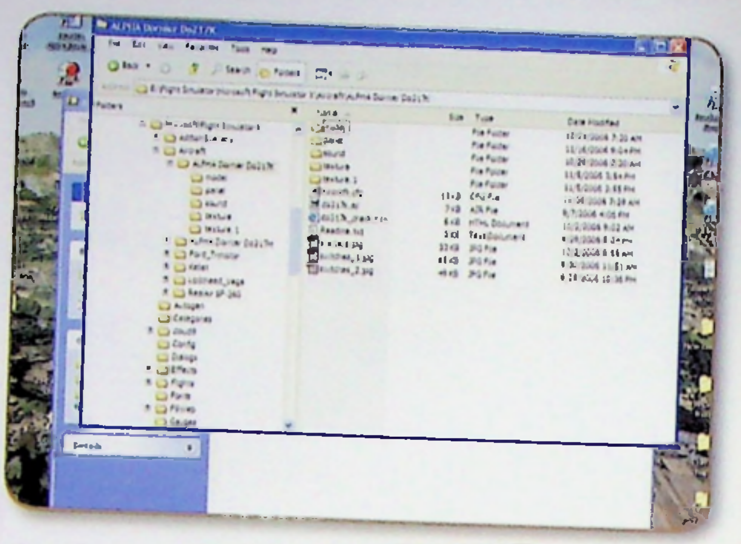
TYPICAL CONTENTS OF AIRCRAFT DOWNLOAD

That's how it worked in FS9. Now that FSX has an Aircraft folder, we can do something similar. But don't start copying right away. With FS9, it was usually safe to copy both main folders, Aircraft and Gauges, directly from the zip file into the FS9 folder, and when Windows Explorer asked if it was all right to overwrite files, click "Yes to all." Don't do that with FSX. There is a small but real danger of overwriting a new and improved FSX file with an old FS9 file of the same name, and that can make trouble elsewhere. Instead, open the zip file's Aircraft folder and copy its contents—the files and subfolders—into your FS9 Aircraft folder. We will then do the same for the Gauges.



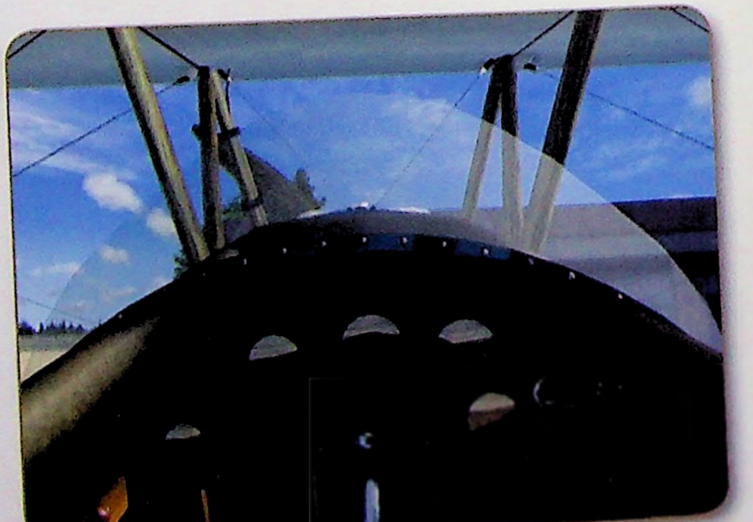
FROM ZIP FILE TO FSX FOLDER

First, the semi-cautious method. Instead of copying the whole Gauges folder from the zip file, open the folder and copy its contents into FSX Gauges. If Windows Explorer warns you of an overwrite, click "No." We want to leave the new gauges in place. But what if they don't work with the old aircraft?

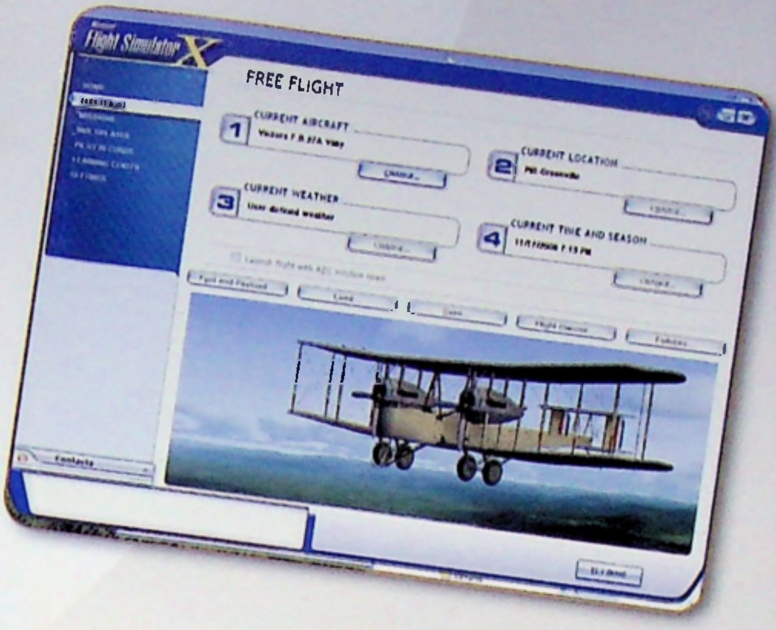


CONTENTS OF AN AIRCRAFT FOLDER

That's not a problem, if we use the following, ultra-cautious method of installing gauges. Instead of copying the add-on gauges into the main FSX Gauges folder, go to the FSX Aircraft folder (the one we created earlier) and open the subfolder with your new aircraft in it. Inside you will find several more subfolders: usually model, panel, sound, and one or more texture folders. We are going to copy our add-on gauges—not the folder but the contents of the folder—into the aircraft's panel folder. This works because, when it loads a new aircraft, FSX (and FS9 too) looks for the aircraft's gauges in its panel folder before it looks in the main Gauges folder. This is a neat trick. It avoids any question of overwriting new gauges, and if you decide to remove the new aircraft, you can just remove its folder; you don't need to remember which, if any gauges, might be left over in Gauges. The only catch is, if your add-on has multiple aircraft folders, you need to copy the gauges into each aircraft's panel folder.



MISSING GAUGES



THE MISSING FS9 AIRCRAFT CAN BE CONVERTED

Aircraft with an Installer Program

What if the aircraft has an installer program? Theoretically, we can now point the installer to the FSX folder instead of the FS9 folder, and the aircraft files will go into the Aircraft folder, same as before. In practice, that may work. I would argue, though, against doing that. Instead, create a blank folder on your desktop and, when the installer program asks for your FS folder, point it to that blank folder and let it put all of its new files in there. Now, using Windows Explorer, open this blank folder and copy the contents of each subfolder into FSX, using the same, ultra-cautious method we described in the last paragraph.

This gives us more control over the process and avoids the problem of overwriting files. Moreover, if something doesn't work, we'll have an idea of what files the aircraft is looking for.

The Aircraft Cockpit GX offers a realistic simulator cockpit environment. Whether you fly a transport or a Cessna, the generic design feature will bring your flight immersion to **A NEW LEVEL**.

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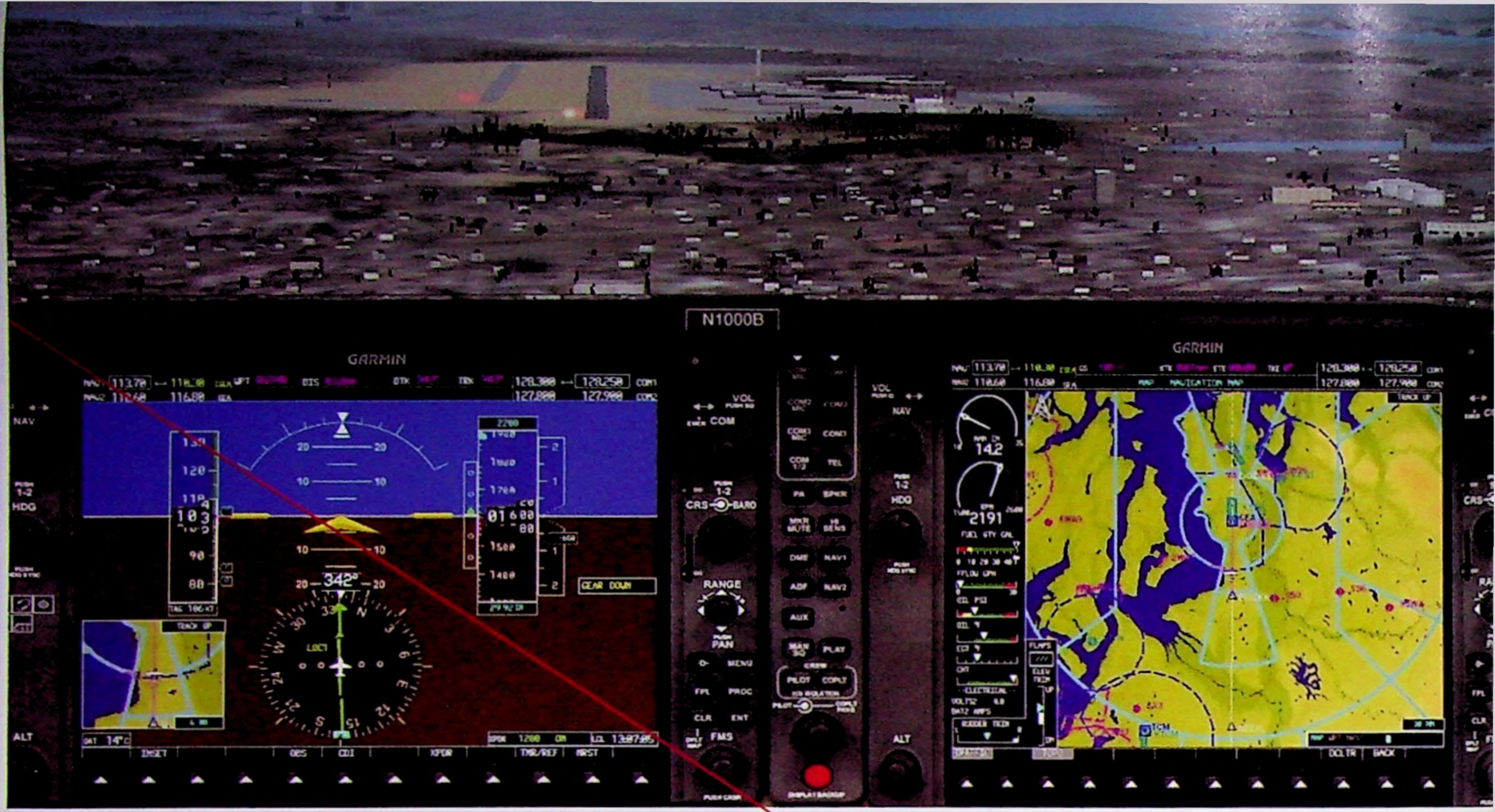
Things That Can Go Wrong

In part one of this article, we've described three basic methods of installing pre-FSX aircraft in FS9. In part two, we'll discuss what to do when things still don't work. The most common problems are missing gauges and textures; we'll tell how to track these down. Sometimes, when you first load a new aircraft, FSX will ask you to confirm a publisher, gauge, or module. Generally speaking it's safe to click "Run" (for so-called unknown publishers) and "Ok" (to trust gauges or modules). With FSX, though, some older gauges will still not work, even if we click "Ok"; in part two, we'll show how to replace these non-working gauges with newer equivalents. ✈

FS9 AIRCRAFT WITH FSX SCENERY

CURTISS JENNY FLIES AGAIN!



GPS in IFR Flight

BY HANS V.D.BIGGELAAR, PH.D., CFII

There we are on final at KSEA (SEA/TAC, WA) for the ILS Rwy 34R approach. We'll land, taxi to the hangar, go to the pilots' lounge and talk about GPS approaches…

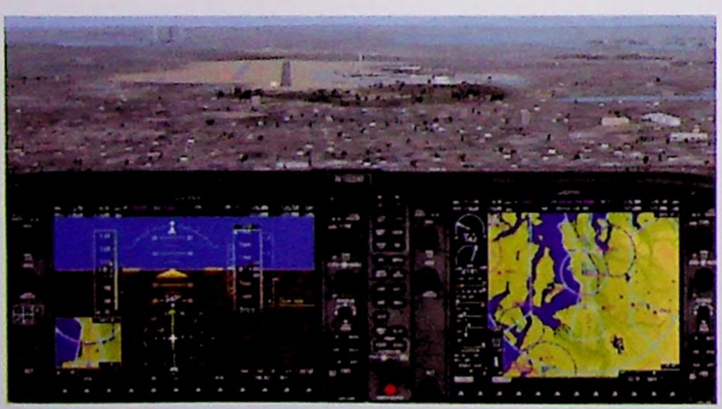


FIGURE 1 – FSX'S MOONEY BRAVO WITH THE GARMIN 1000 AND MS DEFAULT SCENERY.
INCIDENTALLY, THE PDF (PRIMARY FUNCTION DISPLAY) IS VERY GOOD, BUT THE MFD (MULTI FUNCTION DISPLAY) IS MISSING A LOT OF FUNCTIONALITY.

As is so often the case with very complex systems, the principles involved are usually quite simple. It's the implementation that causes the difficulties. Today's GPS system certainly qualifies as such a system and to get some appreciation for the engineering marvel it is, it is necessary to look into some of the items that make it work. But first the principle. In essence it's a system of 24 satellites (and a few spares) that generate radio signals. So if you measure the time it takes from those points in space to the target, the GPS receiver, and you know the position of those satellites at the time they sent the signal and given the fact that those signals propagate at the speed of light, you can calculate how far you are from the transmitters. Just describe a sphere using those distances as radii around each of the transmitters. These intersect, describing a small (hopefully) volume. And that's where you are. This may be difficult to visualize in three dimensions, so it may help to look at the two-dimensional example shown in Figure 2.

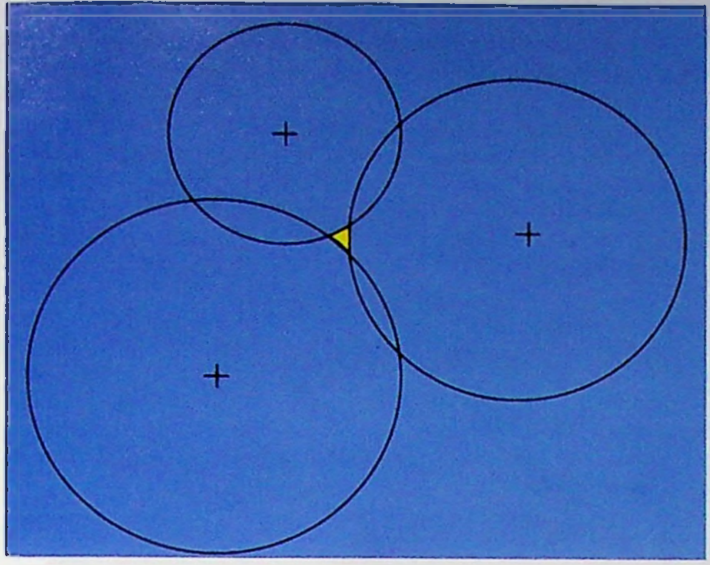


FIGURE 2 – TWO-DIMENSIONAL EXAMPLE. YOU ARE IN THE LITTLE YELLOW AREA. THIS DRAWING IS MOST CERTAINLY NOT TO SCALE!

It still sounds rather straightforward, so what are the problems? There are several, some become obvious, if you just think a little about the system. For instance, the signals from the satellites propagate at the speed of light, thus if your timing measurement is off by as little as one microsecond, your position is off by 300 m (about 980 ft). Also you must know the position of the satellites with great accuracy, since any deviation from the true position translates into the same error on the ground. Furthermore the signals travel through the air layers above the earth and are affected by humidity, pollution, ionization etc. In addition the satellites don't just hang obediently in their assigned orbits; they drift off and occasionally must be put back where they belong. During that period and some time thereafter, their position is not correct and you must have a means of determining when they are positioned correctly again. In the GPS receiver a great amount of complicated signal processing is carried out to correct for those errors and to determine the time with the required accuracy. The list is actually quite a bit longer but this hopefully gave you some appreciation for the difficulties. Just to mention one more, a rather esoteric one. The satellites in their 12,600 mile above the earth orbits complete one orbit every 12 hours. Thus they travel at about 8400 mph (the arithmetic is left to the reader) and that is a speed sufficiently great with respect to the receiver, that relativistic effects have to be taken into account. It means that to an observer on earth, the satellite clocks are perceived as running a little faster than the ones on earth; in fact they gain about 38 microsecs per day. And as you now realize, that is not a delay that can be ignored. The solution to this is quite elegant. The designers made the clocks aboard the satellites run slow by that amount and that puts them in sync with the earth clocks. If you care to read more about this fascinating subject, an excellent source is **http://en.wikipedia.org/wiki/GPS**. That 17-page article also contains numerous links to related subjects.

Even with all this taken care of, the accuracy of the position indicated by a GPS receiver is not good enough for what is needed for ILS approaches, or in general ones that require vertical guidance. Incidentally, how the elevation of the receiver's location on earth is determined is in itself a complicated affair. Just consider that the earth is not shaped like a billiard ball, thus the local terrain elevation has to be taken into account. Therefore the plain vanilla GPS is approved only for non-precision approaches.

However, there are straightforward ways to improve considerably on that. The three methods used are DGPS (Differential GPS), WAAS (Wide Areas Augmentation System) and LAAS (Local Area Augmentation System). They all use the same principle and only differ in detail. The location of a station, as shown on the GPS, is compared with the very carefully surveyed (in Lat, Long and elevation) location of that station. The difference is used to compute an error signal which is then transmitted to the onboard GPS receiver, which thus gives a very accurate display. In the case of the DGPS, this is done at just one station very near the airport and the error signal is transmitted to the airplane over a VHF link. WAAS is just a much more elaborate version of the same idea. In this case the error signals are generated at 25 stations, which are distributed mostly over the continental USA. At two master stations the signals are processed and uplinked to two geostationary satellites, from which the airplane receives the corrected information. On the GPSs that are equipped for WAAS, that shows up as satellites with numbers 30 and higher. LAAS is more like DGPS in the sense that the correction is only done locally. However, here GPSs in several locations close to the airport are used to compute the error signal, which is received by onboard equipment that updates the GPS indication. This system is good enough for CAT I, II and III approaches and may even be adapted to curved approach paths, which would allow more flexible traffic handling.

Here follow a few more observations that pertain to GPSs in general.

In many of the manuals and on the GPS displays themselves, the terms DTK (Desired TracK) and TRK (TRacK) are used. However, these are bearings and expressed as angles, although the word "track" is also used to mean a course over the ground. On the other hand, XTK (cross track error) is a distance. The next Figure (Figure 3) shows the various terms and their relationship.

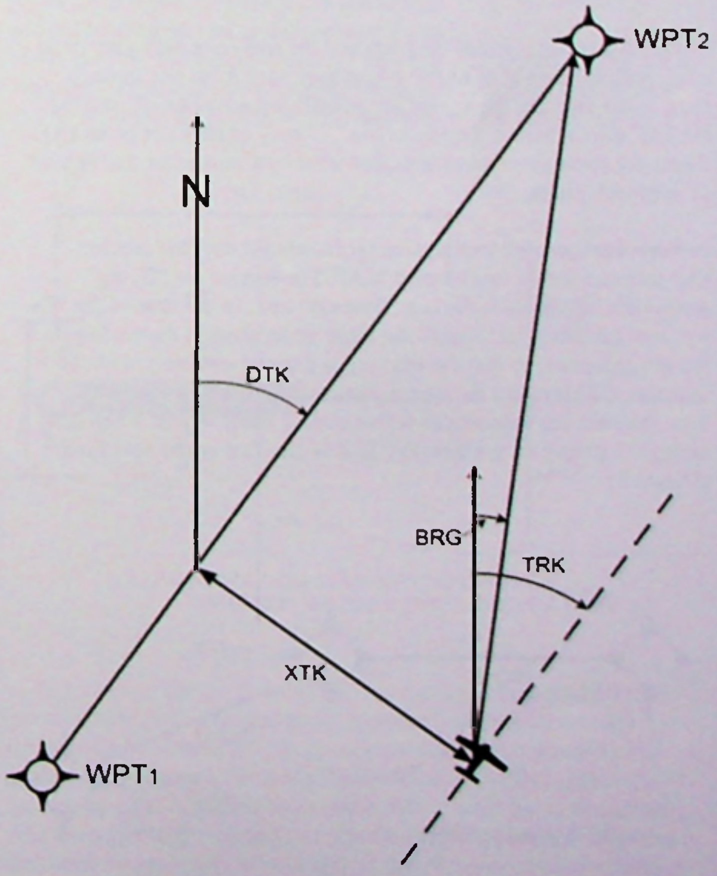


FIGURE 3

Note also, that if the TRK and DTK are the same, it only tells you that you are paralleling the desired ground track, i.e. the direct line from WPT1 to WPT2, but you are not necessarily on it. The XTK tells you how far off you are, which is the CDI indication. In this no-wind condition, BRG and TRK are the same. Otherwise, their difference is the WCA (Wind Correction Angle). When enroute, "Direct To" a WPT is selected, DTK, TRK and BRG become the same, as well as the HDG for no wind. The XTK is initially 0.

What all GPS approaches look like in general is depicted in the next illustration. (Figure 4)

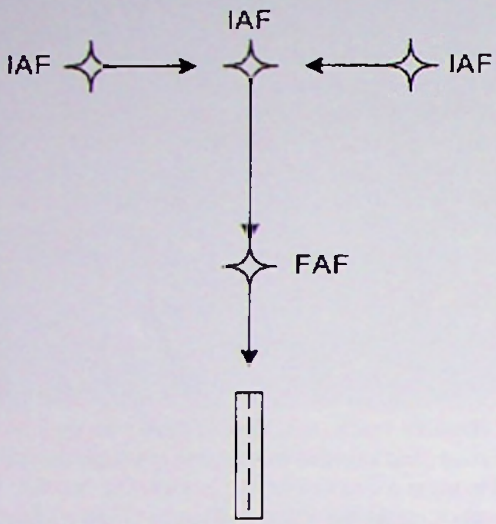


FIGURE 4

This is a rather stylized diagram and the real ones may vary quite a bit, both in number of IAFs, which may vary from one through four, in the fact that the angles are usually not equal to 90° and that the IAF shown here at the top of the "T" may or may not be an IAF. There are some more variations, but your best source for that is a set of approach plates.

Note that there are two wpt symbols, one for the four labeled IAF and one for the one labeled MAP. The former are "fly-by" waypoints, while the latter is a "fly-over" one. In the case of the "fly-by" wpt the autopilot "leads" the turns by an amount depending on the groundspeed, so that the next leg is entered smoothly without overshoot. This raises the question when arriving at a wpt, when does the next leg become the active one, in other words, when does it change to purple on the display? This is clarified in the next Figure. (Figure 5)

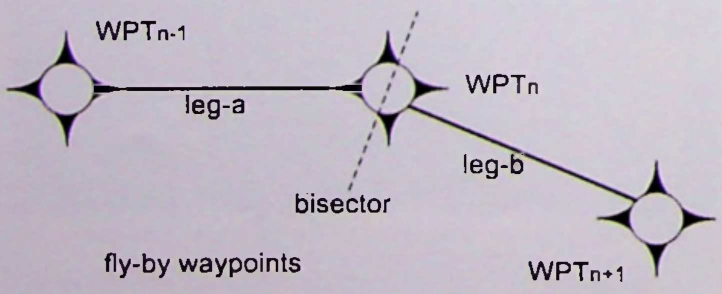


FIGURE 5

The moment the aircraft, flying from WPTn-1 to WPTn+1 , crosses the "bisector" (bisecting the angle between the two legs), the active leg changes from leg-a to leg-b.

One more thing about "fly-over" wpts. They are used to depict the MAP (Missed Approach Point) and are usually situated right at the threshold of the runway and then identified with something like "RW06". Occasionally, however, they are "named" wpts and that is done when the MAP is located a small distance before the threshold.

An example is the MAP on the GPS Rwy 32 approach at KIZG (Freyburg, ME) (top of Figure 6). For instance, in this airport the MAP is 0.3 miles before the runway edge as you can see on the "profile" view. (Bottom of Figure 6)

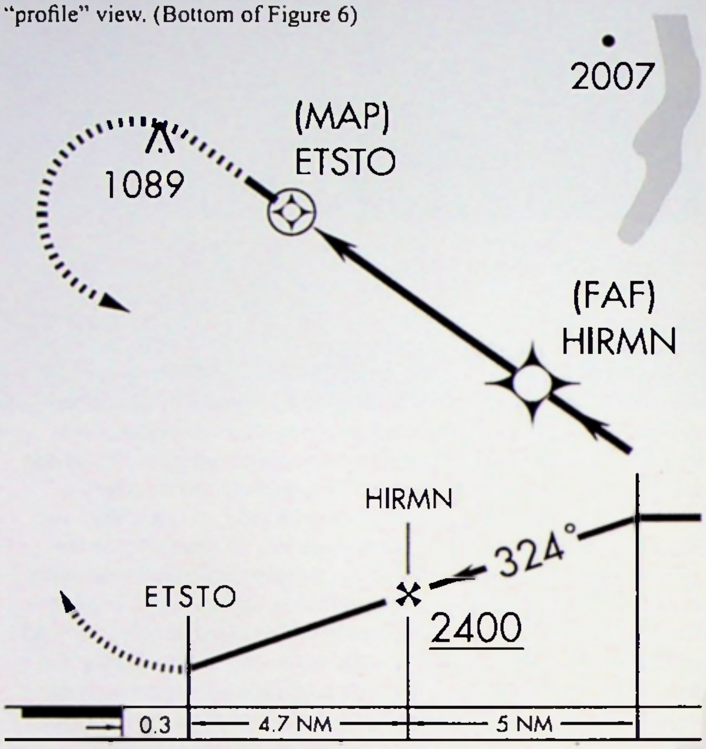


FIGURE 6 - GPS RWY 32 AT KIZG (FREYBURG, ME)

It's unfortunate that the profile view of this and similar approaches depicts an approach path that is like a glide slope. Because you really should descend to the MDA as soon as legal and practical, so that you have the maximum time to spot the runway environment and you can start descending further and land. The difference in the approach paths for an ILS and a non-precision approach is shown in Figure 7.

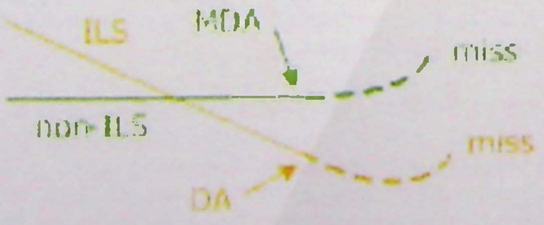


FIGURE 7 - IT'S LEGAL, IN FACT OFTEN UNAVOIDABLE, TO DESCEND BELOW THE DA, BUT NOT TO GO LOWER THAN THE MDA; "M" REALLY STANDS FOR "MINIMUM".

You can appreciate how important it is to get down to the MDA as soon as is legal and practical, which means right after HIRMN, then the moment you see the runway environment, which depends on the visibility, you can start descending. (Figure 8). This is what you'd see with an overcast at 1500 ft (40 ft above the MDA) just at the MAP and 10 mi visibility.

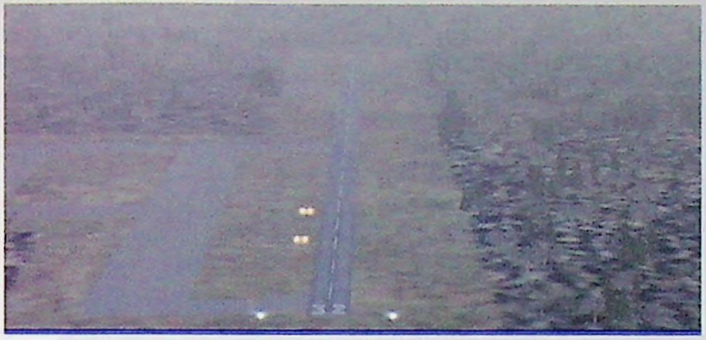


FIGURE 8

If you happen to break out at this point, your only choice is to go "missed", as you'd still have 1000 ft to come down. Even if you plan to touch down 1/3 down the runway it'd mean a slope of 36 (atan (1013/1400))!!

Another thing that is often forgotten, since it is not obvious, are the sensitivity changes, i.e. the full-scale deflections, of the CDI during the approach phase. This is shown in Figure 9.

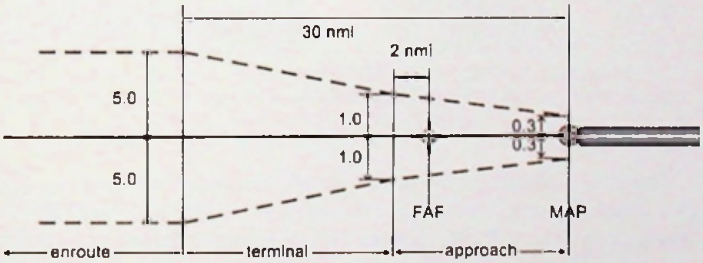


FIGURE 9

There are, however, indications on the PFD that this is happening as is shown in Figure 10.

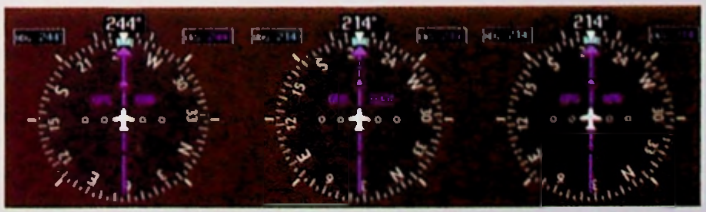


FIGURE 10 - SENSITIVITY CHANGES IN THE CDI DURING AN APPROACH

ENR - enroute phase	TERM - terminal phase	APR - approach phase
5 nmi full scale deflection	narrowing down to 1 nmi	further down to 0.3 nmi
up to 30 nmi to destination	at 2 nmi before the FAF	at the MAP

The first change takes place quite a distance from the destination as you can see in the example shown in Figure 11.

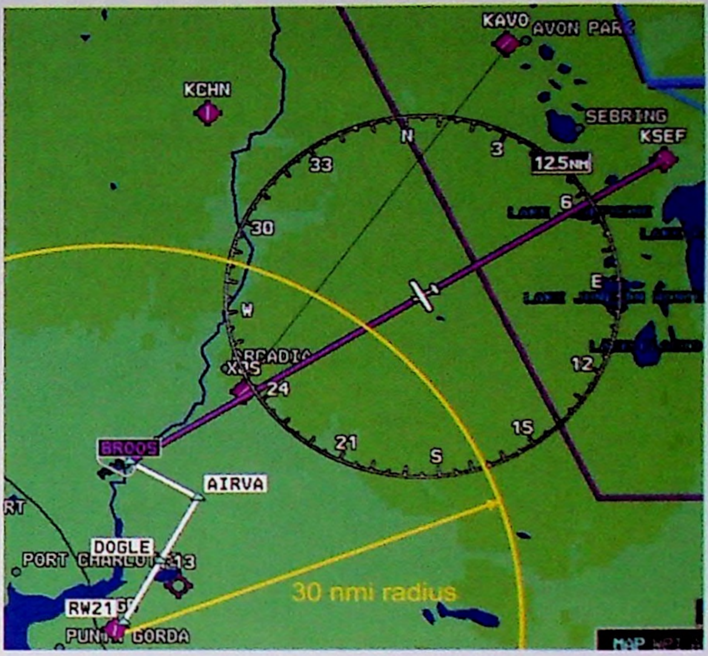


FIGURE 11 - AT 30 NMI FROM THE DESTINATION AIRPORT, THE CDI SENSITIVITY GRADUALLY CHANGES FROM 5 NMI FULL SCALE DEFLECTION TO 1.0 NMI AT 2 NMI BEFORE THE FAF (DOGLE).

When the "miss" is executed at the MAP, the sensitivity resets from 0.3 to 1.0 nmi and then gradually goes to 5.0. If the MAPH point and the holding pattern or the procedure turn is within 30 nmi of the MAP, the HSI will keep indicating "terminal", otherwise it'll switch to "enroute". The same thing happens when you depart from an airport and fly an active flight plan to your destination as is shown in Figure 12

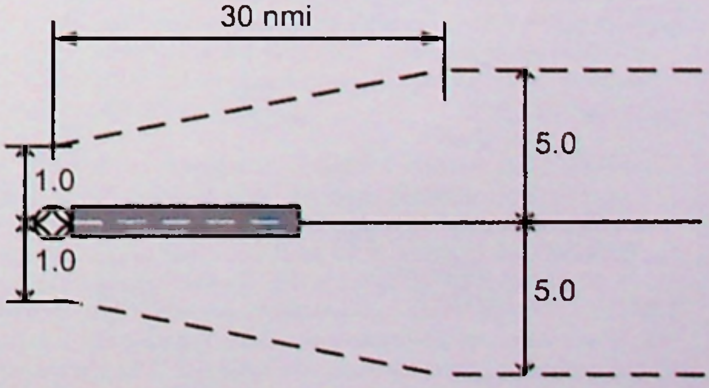


FIGURE 12 – CDI SENSITIVITY CHANGE ON DEPARTURE OR FROM THE "MISS".

If, however, the distance to the destination is less than 60 nmi, the indication will not change to "enroute". On the other hand when you use "Direct To" to go to your destination, the HSI will immediately indicate "enroute". This automatic CDI sensitivity change on an approach is one reason that it is illegal to construct your own GPS aproach to your private strip for instance. Because in that case the sensitvity would stay at the enroute value or at best at the terminal value.

When a pilot typically makes short flights, e.g. just a few hundred miles, it's easy to forget that the course line the GPS draws on the map, between two waypoints is a "great circle route". This can deviate significantly from a course drawn with a ruler on a Sectional, WAC chart or with a string on a wall-mounted chart. See the illustration for a flight from KBOS (Boston, MA) to KSAN (San Diego, CA). Figure 13

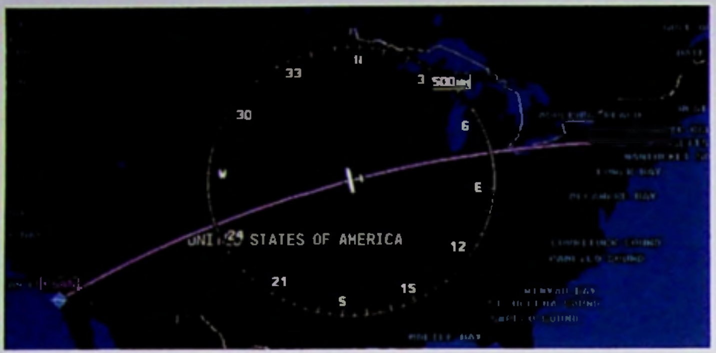


FIGURE 13 - THIS CLEARLY SHOWS THE PRONOUNCED CURVATURE OF A GREAT-CIRCLE ROUTE.

Something else you are more likely to find of interest on such long trips, are SIDs (Standard Instrument Departures) and STARs (STandard Arrival Routes).

Typically when you make a SID part of your flight plan, you'll not see a purple line connecting the departure airport with the first waypoint of the SID. You'll have to handfly that leg. Usually you'll be given vectors from ATC to that first fix, as well as an assigned altitude. These SIDs can be quite simple, vectors to a nearby nav-aid, a VOR for instance and from there: "cleared as filed". Such is the case at KMHT (Manchester, NH) as shown in the Figure 14.

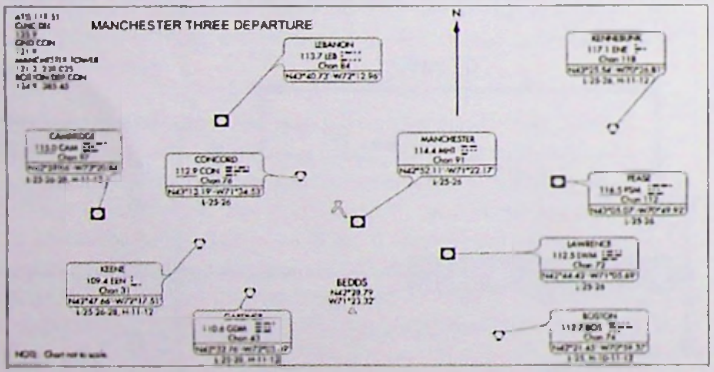


FIGURE 14

There are 9 "first" waypoints, which surround KMHT. It's important therefore to select the one that takes you in the desired direction, if ATC lets you of course. Every once in a while, airline departures to the south are given PSM as the first waypoint, which takes them a bit out of their way but it's done to maintain aircraft separation on that busy route. On the other hand, small-plane traffic usually doesn't bother with a SID here. These SIDs are shown on the last page of the approach plates for the respective airport.

The next one (Figure 15) is an example of a much more complicated one.

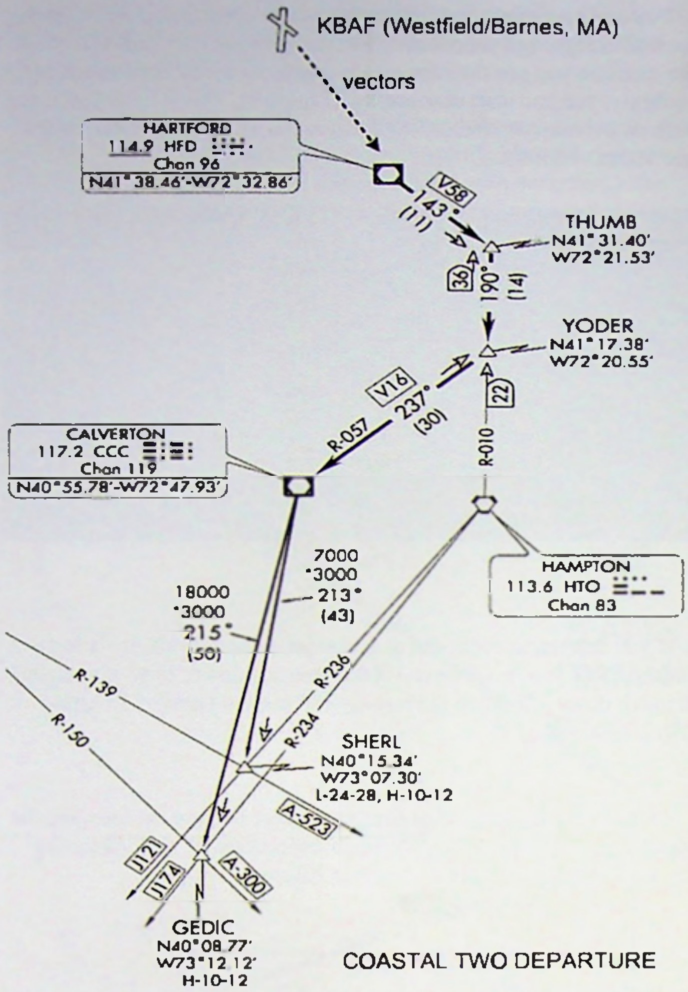


FIGURE 15

This SID is meant for the larger aircraft, just note the MEAs (Minimum Enroute Altitudes) of the last legs, 18,000 and 7,000 ft respectively. Also GEDIC is about 180 mi from the departure airport and definitely not one to chose if your destination is to the north-east. Incidentally, once you are past the entry waypoint (HFD), it's just like any other flight plan as far as the GPS is concerned.

Although you will be given vectors for the initial leg, you must exercise some caution as terrain clearance is still the pilot's responsibility. What can go wrong is illustrated in the following accident report.

On December 2, 1993 there was a tragic accident (two fatalities and one serious injury) involving an Aerospeciale TB-21 on an IFR flight from KLEB (Lebanon, NH) to KGCF (Cleveland, OH). The clearance was in part: "...route of flight will be radar vectors LEB, Victor 496, direct Jamestown, then RNAV to KGCF".

Here follows a transcript of the Pilot (P) ⇔ Tower (T) communications:

1726:30 P: ready for takeoff
1726:40 T: cleared for takeoff
1728:30 T: do you have the hill in sight?
1728:33 P: say again
1728:34 T: could you see that hill there?

There were no further communications
2 min + 4 secs from takeoff till CFIT (Controlled Flight Into Terrain)

The weather, ceiling 14,000 ft broken, visibility 15 miles, winds calm, was certainly no factor, although in Lebanon, NH at 1700 in December it's pitch dark. So what went wrong? The low-time pilot was instrument rated and his passenger was a CFII, who both had made departures from that airport several times, but not at night. It is possible that the confusing organization of the information on the NOS approach plates played a role. And perhaps they hadn't paid any attention to the plate for their departure airport, although it's always a good idea to have that one handy during takoff, in case you need to abort the flight. But in any case it is very advisable to carefully study the plate and familiarize yourself with the departure procedures.

The flight path is shown on the contour map in Figure 16.

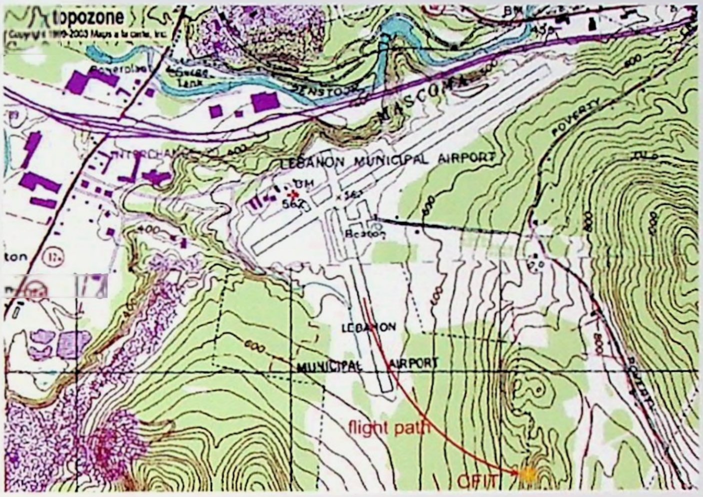
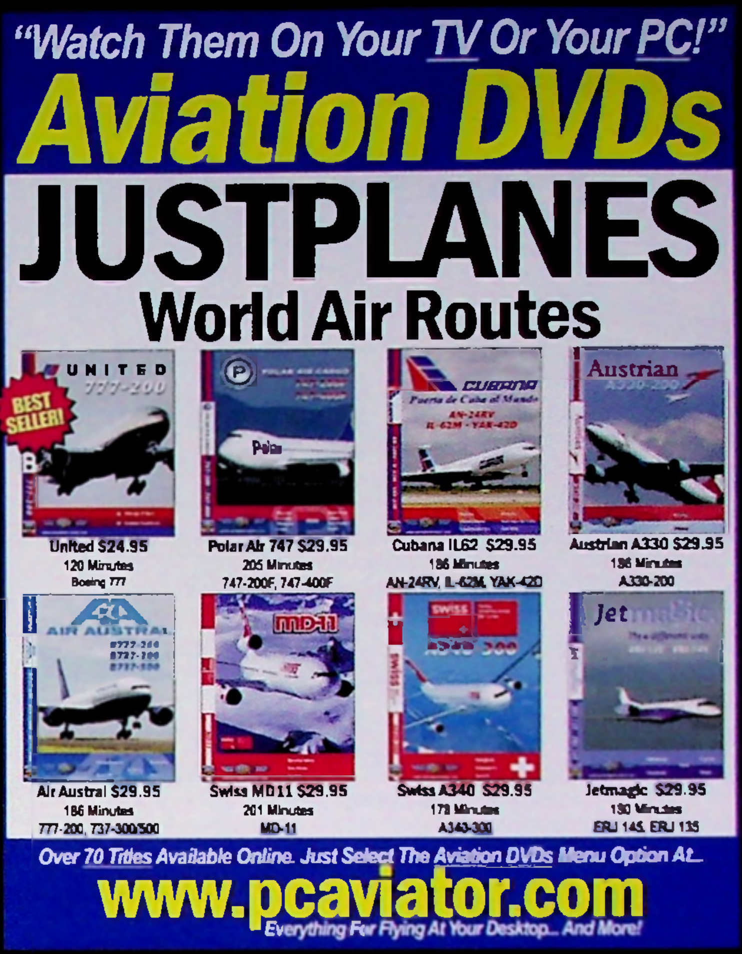


FIGURE 16 – THE FLIGHT PATH OF THE ACCIDENT AIRPLANE. CONTOUR MAP REPRODUCED WITH PERMISSION FROM TOPOZONE (WWW.TOPOZONE.COM).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If the crew had a GPS with moving map that could show "terrain", it would have been obvious to them that they were heading for danger. Figure 17 shows how that would have appeared on the MFD of a Garmin 1000 e.g. I am sure they would have stayed out of the red stuff. Sounds familiar?

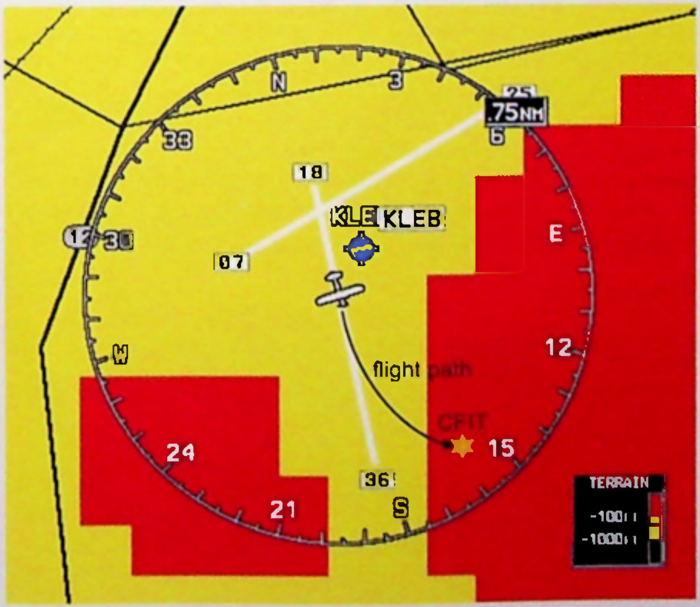

FIGURE 17 – FLIGHT PATH OF THE ACCIDENT AIRPLANE OVERLAYED ON A GARMIN 1000 MFD WITH THE "TERRAIN" FEATURE TURNED ON.

In a way the organization of the FAA approach plates may very well have contributed to this accident. For instance, if there are departure procedures for an airport they are listed at the end of its approaches and also listed under DP at the list of the approaches in the index. The only one for KLEB is called "WHITE RIVER ONE" and applies only to Runway 25, while they were taking off from Rwy 18, so that didn't apply. On the other hand, all the plates for that airport have a white "T" in a black triangle in the legend, indicating that there are "Takeoff Minima". These are primarily weather considerations and since this crew was conducting a "Part 91" operation, it is not unreasonable to ignore that, since weather minima don't apply in that case. However, the full title of Section C, which lists those minima, includes the words " ... and (Obstacle) Departure Procedures". Note the parenthesis, as if to imply that those are not that important. In the paragraph for KLEB, it states specifically for Rwy 18: "...climb visually over airport to cross airport at or above 1500 ft, then proceed on course", which unfortunately they didn't do. There is one more warning sign that is shown on all the KLEB approach plates and that is the MSA (Minimum Safe Altitude) circle with a 25 mi radius centered on the KLEB VOR as shown in Figure 18.

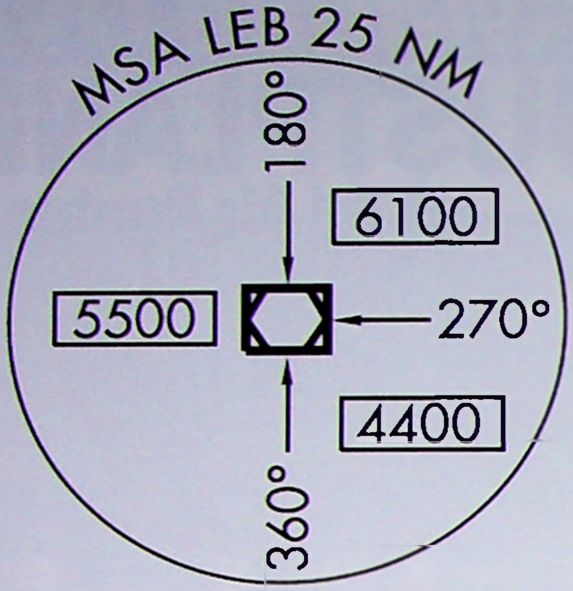

FIGURE 18 – MINIMUM SAFE ALTITUDE AREA FOR LEBANON AIRPORT (KLEB). COMPARE THAT WITH THE ELEVATION OF THAT AIRPORT, WHICH IS ONLY 604 FT.

Note the SE sector with 4400 ft. Unfortunately that little, but oh so important piece of information, is too often ignored by pilots. The FAA requires you to become very familiar with the destination airport, but that also applies to the departure airport.

It's also important to be aware that on a GPS flight plan you may be flying off-airways, thus you don't have the obstacle/terrain clearance as on Victor airways, indicated as MEAs (Minimum Enroute Altitude). To be safe it's a good idea to look at a profile obtained from a flight plan program, such as "Voyager" (Seattle Electronics) or turn on the "terrain" feature on the GPS, if so equipped.

On the other end of the trip we have the STARs, which are similar in some respects to the SIDs. For some strange reason those are not listed with the approach plates of the airport in question, but by themselves in a separate section. What makes them difficult to find, is that they are listed alphabetically by their name, not by airport name. They terminate at a navigational aid, not the destination airport, at least in the USA, and from the last waypoint you should expect vectors from ATC. The starting point is usually quite far out. Also many of their enroute phases are at high altitudes, so they are not for small and local traffic. Part of the "Gardner Three" STAR for KBOS (Boston, MA) is shown in Figure 20.

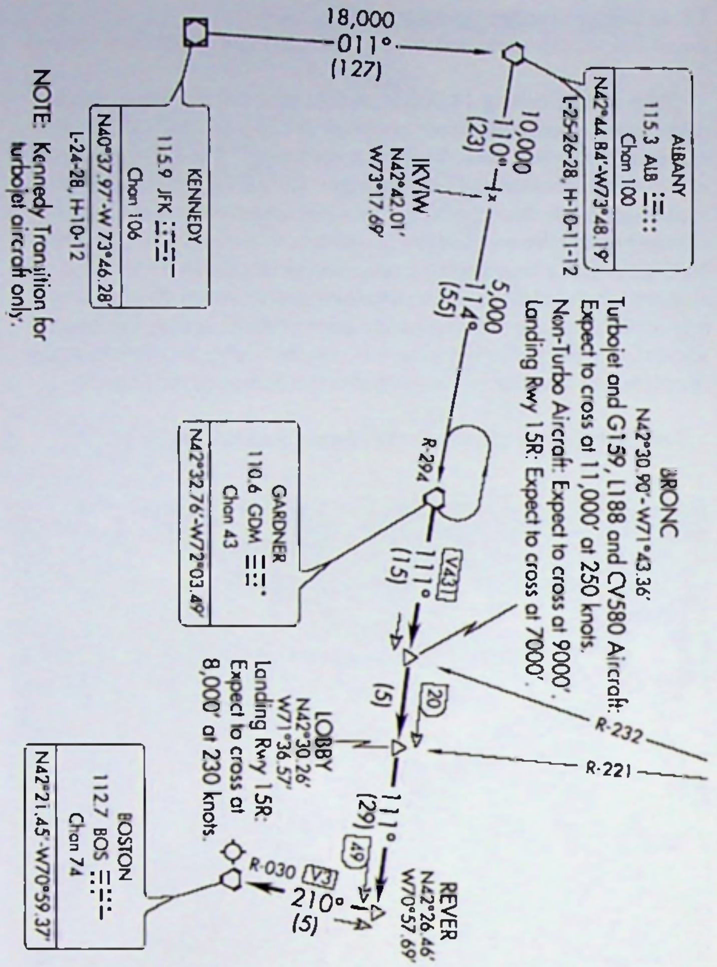

FIGURE 20 – STAR FOR KBOS (BOSTON, MA)

If you are into flying the heavies with your simulator, you'll find that you can very realistically program the FMC (Flight Management Controller) with flight plans that contain all the route phases, i.e. SIDS, airways, STARs and approaches. It may take a while to do that, but then, realism has both its price and its rewards.

Well, that should do it for now. As you can see, there is a great deal more to flying with a GPS then just selecting "Direct To", entering the destination airport name and following the purple line. The observations here were aimed at real flying, but given the realism of several GPSs available as add-ons for FS9 and FSX for instance, they pertain equally to sim flying. ✈

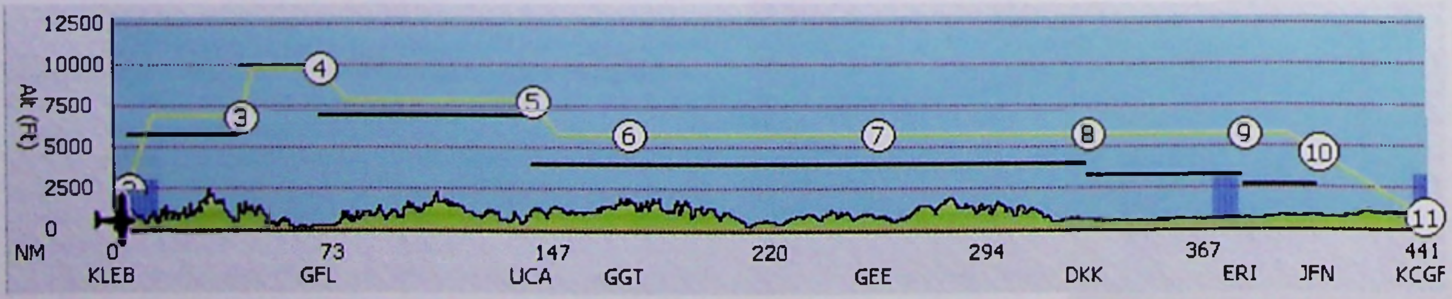

FIGURE 19 - NOTE THAT THE MEA, INDICATED WITH A BLACK LINE, IMMEDIATELY UPON DEPARTURE FROM KLEB IS 5000 FT. THAT WOULD HAVE BEEN ANOTHER CLUE FOR THE CREW.

COMING UP...
...in the February 2007 Issue

Importing Aircraft into FSX – Part 2

David Wilson-Okamura concludes his expansive tutorial on importing aircraft into the new Flight Simulator X. Find out step-by-step how to import your favorite FS2004 aircraft into the new simulator. We have all the tips and tricks for smoothing out the process and getting things to work!

Sim Bloopers and Omissions

No one is perfect and not every piece of software you use will be perfect either. Tom Kurtz takes a look at some of the bloopers and omissions from the latest version of Microsoft Flight Simulator.

POV – FSX Choppers

"Approaching the oil rig I noted the winds. Our heading had been a solid 330 degrees and the winds were from 120 with gusts to 25. Landing on the rig would require some skill, but fortunately there were no derricks to contend with on the approach. I swung the Jet Ranger around the rig on my recon...all it takes is one wire strike to ruin your whole day...and set up for an into the wind approach, with a slight left front quartering component."

Pirates of the World Wide Web

Glamorous... not so... Infamous... not so... There are no Robin Hoods on the internet! THEY seem to think of themselves as modern Robin Hoods, but in all reality they are just as 'mistaken' as the next car thief, burglar, counterfeiter or drug dealer!

Rudder Pedal Mods

Matthew Edwards shows you how to modify your rudder pedals for more realistic operation in your favorite simulator.

Updating FMS Databases

No doubt many of us have struggled with trying to update the information on our favorite FMS devices included in popular add-on aircraft. David Ison shows you how it is done in a step-by-step tutorial.

Reviews

We have planned reviews of these great new flight simulation products:

- Aerosoft's My Traffic X
- PerfectFlight's Fly the MD-11
- Aerosoft's Flight Calculator
- CH Product's Multi-Function Panel

PLUS

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Captain Mike Ray serves up another great flight lesson and Hans takes a look at high altitude flying in light aircraft.

Freeware Frenzy

We continue our look at selected freeware simulator add-ons.

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Simulating Space Flight

BY CHUCK BODEEN

Search the Internet and you will find several programs that can be used for the simulation of space flight. In this article I'll tell you a bit about a few of those and then explore what can be done with X-Plane.

A-OK! The Wings of Mercury

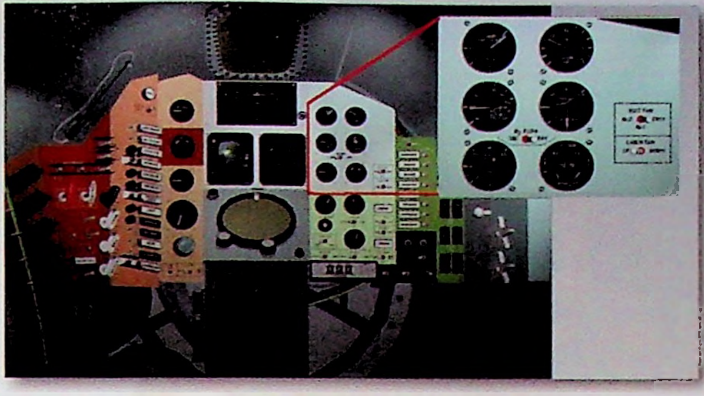
In the early 60's, the Mercury program put the first Americans into space. This specialized simulator duplicates the operation of the Mercury spacecraft, even to the point of some little quirks, such as the ability to accidentally activate two different attitude control modes simultaneously, draining your fuel in the process.

Mercury was designed to send one man around the earth for three-orbits. The initial flights included sub–orbital tests and the original design was stretched to allow six- and eighteen-orbit missions. Since each spacecraft was modified for each task, no two were alike. The spacecraft represented by this simulator created by Joseph Nastasi and Jeff Quan is based on capsule 13, the first orbital model.

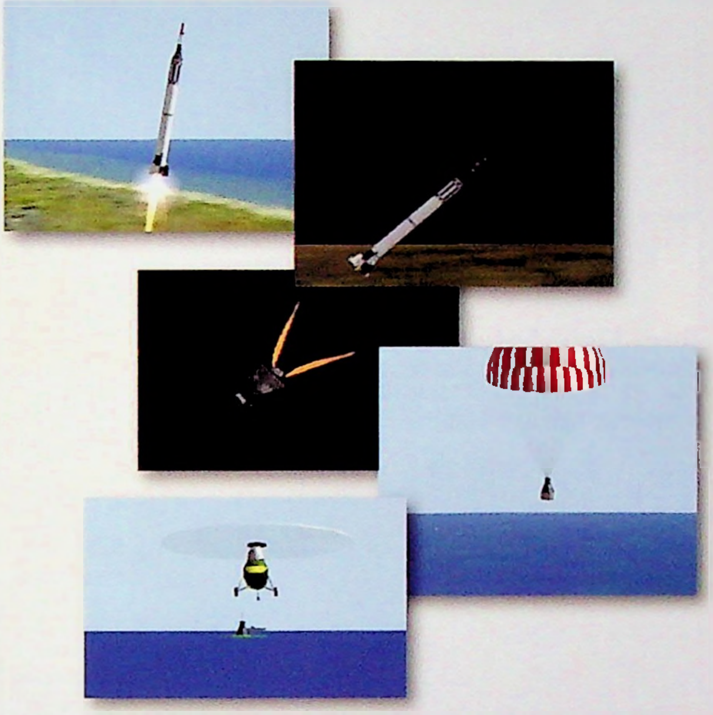
The Redstone rocket was used for sub–orbital flights and the Atlas Intercontinental Ballistic Missile was used to boost Mercury into orbit. A-OK! The Wings of Mercury can simulate both the Redstone mission (a fifteen minute, 115 mile high flight over the Atlantic) or an Atlas-launched three orbits which takes almost five hours.

Created by a group of contractors and politicians under pressure to produce an American space success at the dawn of the Cold War the first manned spacecraft of the United States was obstinate in many ways. All of the manned missions were completed successfully in spite of some early failures.

You can download at **http://www.aokwom.com/** and try either the Windows XP or Mac OS X demo version for free. The demo limits you to sub-orbital missions and does not permit networked simulations. The full version CD which includes both Windows XP and Mac OS X versions and a bonus folder of historic Project Mercury Documents in PDF format may be ordered from the web site for $49.95 plus S&H.



ALTHOUGH THE INSTRUMENTS APPEAR SMALL, CLICKING ON ANY PORTION OF THE MERCURY PANEL BRINGS UP AN ENLARGED VIEW OF THAT SECTION.



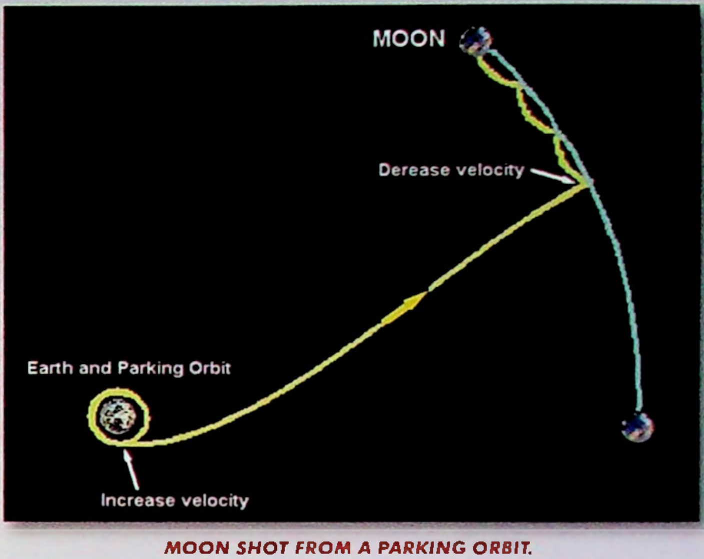
THE WINGS OF MERCURY SUBORBITAL MISSION SEQUENCE INCLUDES MANY REALISTIC STEPS. THAT'S AN AIRCRAFT CARRIER WAY IN THE BACKGROUND OF THE LOWER PICTURE.

OrbitXplorer

Astronomers like to talk about the "N-Body Problem". The Moon or a satellite going around the Earth is a "2-Body Problem" which involves only the gravitational pull of one body upon the other. But when you use Earth, satellite, and Moon or Earth, Moon, and Sun then you have a "3-Body Problem".

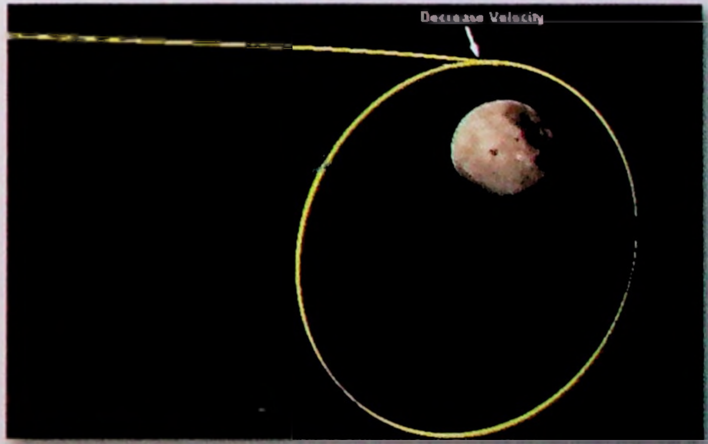
Tore Ottinson has created "OrbitXplorer" or "OX" for short which solves the N-Body Problem for N from 2 through 10. By adding solar system bodies one at a time you can see what effect each might have on the path of a space vehicle. A satellite going around the Earth follows a simple circular or elliptical path. For a lunar mission you must, of course, include both the Earth and the Moon. A trip to Mars must involve the Sun's gravity, but does Jupiter have a serious effect on the path? And how about those interplanetary trajectories that use close passes of one planet to get to the next?

You can learn about OX at http://www.ottisoft.com/ where you may download a free trial version that stops after 20 seconds. After evaluation you may purchase it for US$25.



MOON SHOT FROM A PARKING ORBIT.

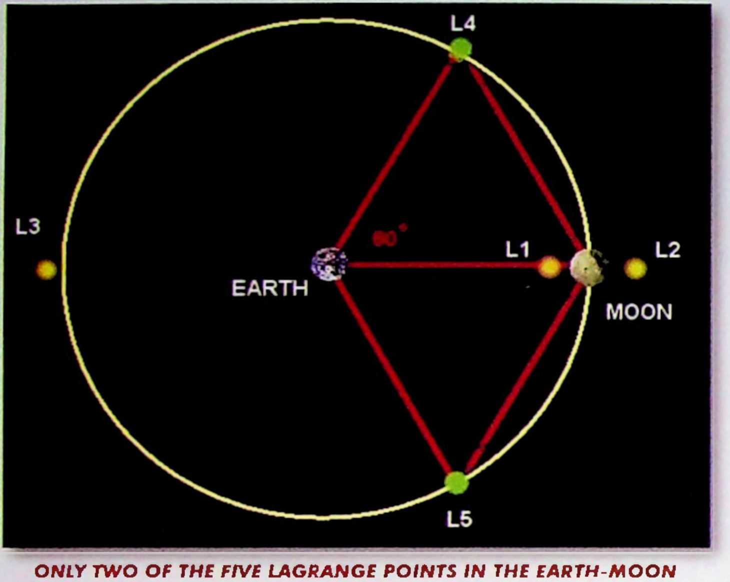
You can use programs available on the Internet or just the application of Kepler's Laws to calculate starting values of position and velocity to obtain desired orbital simulations. Trial and error also works with OX. That's what I did to simulate a lunar mission. The vehicle is first placed in a near-circular parking orbit and then, at some point, a rocket is burned to increase the velocity so the ship nearly escapes the earth's gravity. If it is aimed correctly it will come close to the Moon. At that point a retro-rocket is fired to reduce the velocity and place the vehicle in lunar orbit. The rocket "burns" are accomplished by stopping OX and changing the velocity vector components.



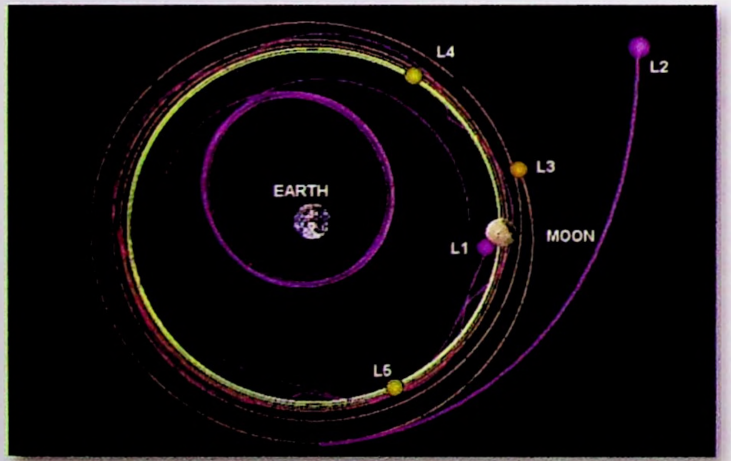
LUNAR VEHICLE IS PLACED IN ORBIT AROUND THE MOON. ORBITXPLORER PERMITS YOU TO CENTER THE VIEW ON ANY OF THE OBJECTS.

There is an interesting "7-body" problem that can involve the Sun or the Earth as the large center body. Considering the Earth, there are five places where a space vehicle feels net forces form the Earth and the Moon that keep it rotating with the same angular velocity as the Moon. These are named after Josef Lagrange (1736-1813) who discovered them. L4 and L5 are stable, in that vehicles placed there will stay in position as the Moon turns around the Earth. L1, L2, and L3 are unstable. Objects placed at these points will move away if there is even a small disturbance — or, in the case of a numerical simulation, just a bit of round off error.

Using the Sun as the central body, astronomers have found clusters of asteroids (The Trojans) 60 degrees ahead of and behind Jupiter in its orbit – so Lagrange must have been right.

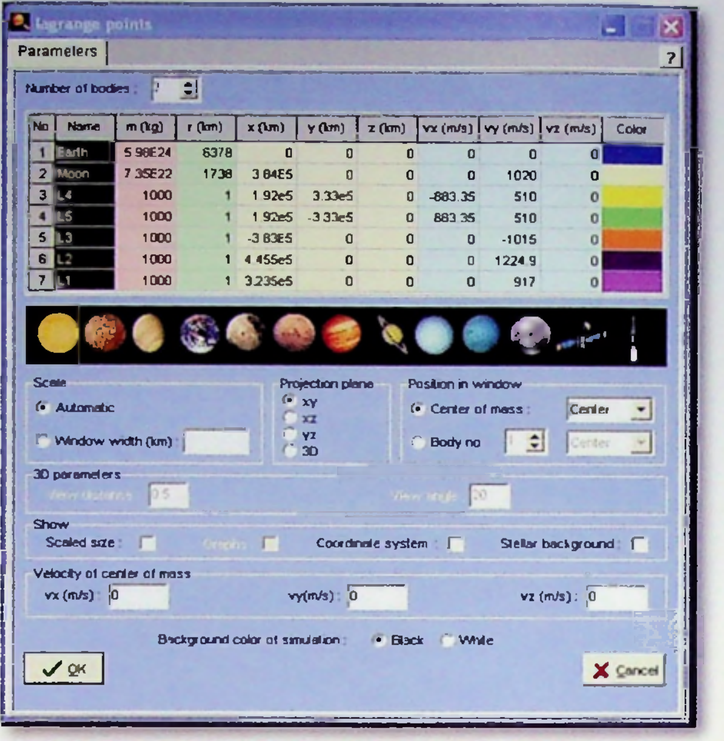


ONLY TWO OF THE FIVE LAGRANGE POINTS IN THE EARTH-MOON SYSTEM ARE STABLE.



THE LAGRANGE POINTS AFTER THREE LUNAR MONTHS. L4 AND L5 ARE STILL AT THE 60 DEGREE POINTS AHEAD OF AND BEHIND THE MOON. L1 HAS TAKEN A FEW TURNS AROUND THE EARTH AND THEN GONE OUT CLOSE TO THE MOON --- EVEN ORBITING IT. L2 HAS GONE PROGRESSIVELY FURTHER FROM THE EARTH AND IS NOW IN A FULL ESCAPE MODE. L3 STARTED JUST A LITTLE FURTHER FROM THE EARTH THAN THE MOON, BUT IS NOW FURTHER OUT AND ABOUT TWO LAPS BEHIND THE MOON.

OrbitXplorer is installed with a self-extracting program and comes with a library of predefined examples and includes excellent documentation and help files. You may use images of solar system objects or just colored dots to represent the bodies in question. The speed of simulation is easily controlled and distances, speeds, and accelerations can be shown on the screen.



Number of bodies : 7

No	Name	m (kg)	r (km)	x (km)	y (km)	z (km)	vx (m/s)	vy (m/s)	vz (m/s)	Color
1	Earth	5.98E24	6378	0	0	0	0	0	0	🟦
2	Moon	7.35E22	1738	3.84E5	0	0	0	1020	0	⬜
3	L4	1000	1	1.92e5	3.33e5	0	-883.35	510	0	🟨
4	L5	1000	1	1.92e5	-3.33e5	0	883.35	510	0	🟩
5	L3	1000	1	-3.83E5	0	0	0	-1015	0	🟧
6	L2	1000	1	4.455e5	0	0	0	1224.9	0	🟪
7	L1	1000	1	3.235e5	0	0	0	917	0	🟪

Scale
● Automatic
☐ Window width (km) :

Projection plane
● xy
○ xz
○ yz
○ 3D

Position in window
● Center of mass : Center
○ Body no 1 Center

3D parameters
View distance 0.5
View angle 20

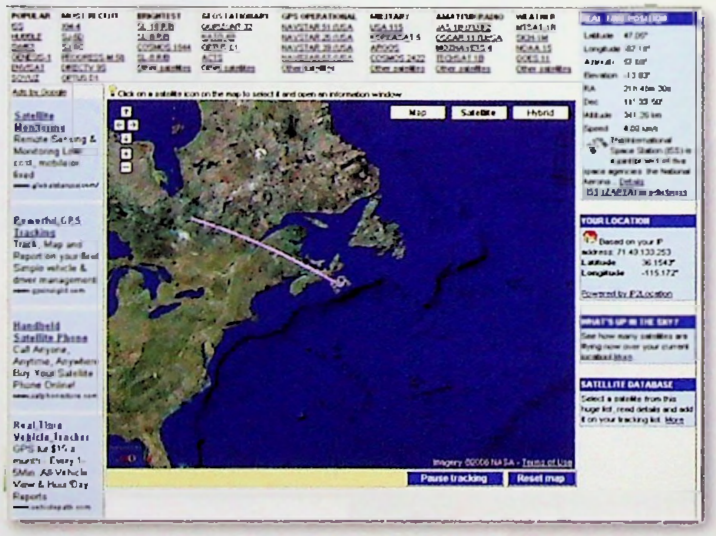
Show
Scaled size : ☐
Graphs ☐
Coordinate system : ☐
Stellar background : ☐

Velocity of center of mass
vx (m/s) : 0
vy(m/s) : 0
vz (m/s) : 0

Background color of simulation : ● Black ○ White

THE ORBITXPLORER CONTROL PANEL SET UP FOR SIMULATION OF THE LAGRANGE POINTS.

Real Time Satellite Tracking



THE REAL TIME SATELLITE TRACKING PROGRAM SHOWS THE INTERNATIONAL SPACE STATION JUST LEAVING THE COAST OF NOVA SCOTIA ON THE MORNING OF NOVEMBER 14, 2006.

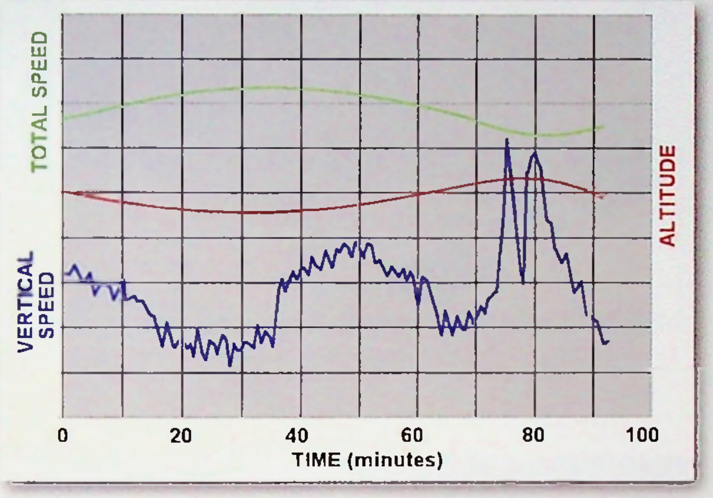
If you are interested in finding the locations of Earth-orbiting satellites in real time, go to http://www.n2yo.com/ where you can track literally hundreds of objects which have been placed in Earth orbit. These are categorized according to 32 purposes for their missions. One section lists the most brilliant which makes it easy for you to look for them in the morning or evening sky. When they are operational, you can even track Space Shuttles and the Russian Progress-M 55 and Soyuz-Tma 7 vehicles. You can zoom in and out and look at a map, a textured rendition of the Earth, or a combination. Best of all, Real Time Satellite Tracking is absolutely free of charge.

X-Plane

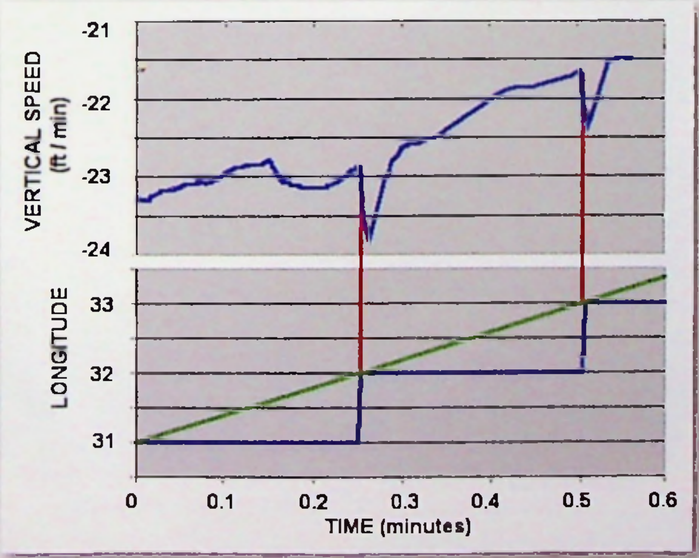
The Manual Files that come with X-Plane include sections entitled Trans-Atmospheric Flight Operations, Flying on Mars, and Flying the Space Shuttle which will get you started on the simulation of space flight.

Orbital Flight

Using "Output / Local Map" you can place any vehicle as high as 999,999 feet at a speed of up to 15,012 knots. That's just about the same speed OrbitXplorer finds for a circular orbit at that altitude. Entebbe, Uganda is right on the equator, so I started both equatorial and polar orbits over that point. Within the limits of numerical precision, I found acceptable agreement between the results from X-Plane 8.50 and OX.



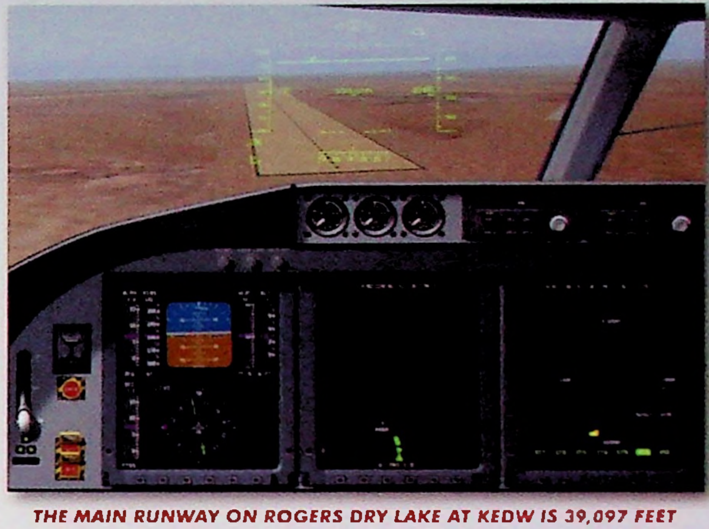
THESE DATA (TAKEN TEN SECONDS APART) ARE FOR A NEARLY CIRCULAR ORBIT FROM X-PLANE 8.50. THE BLIPS IN THE VERTICAL SPEED (SCALE EXAGGERATED) ARE ATTRIBUTABLE TO THE FACT THAT X-PLANE ACTUALLY USES A SERIES OF FLAT EARTH APPROXIMATIONS INSTEAD OF A ROUND EARTH MODEL.



WHEN DATA POINTS ARE COLLECTED AT THE RATE OF 10 PER SECOND IT IS OBVIOUS THAT THE VERTICAL SPEED IS AFFECTED BY THE FACT THAT SCENERY FILES ARE LOADED AND UNLOADED AS THE VEHICLE CROSSES LINES OF LONGITUDE IN AN EQUATORIAL ORBIT. THIS IS AN ARTIFACT OF THE SIMULATION AND IS NOT RELATED TO PHYSICS.

Space Shuttle

The first time I tried to land the Space Shuttle I started over San Francisco International (KSFO) at 100,000 feet and 10,000 knots. When I looked at the map just a few minutes later I had overshot KEDW – Edwards Dry Lake. Finally, I more or less walked my way looking at the map frequently and making adjustments to speed and altitude so that I thought I might make the landing on the lake. At last, that seven and a half mile dirt runway came into view and I was able to do a nice landing.

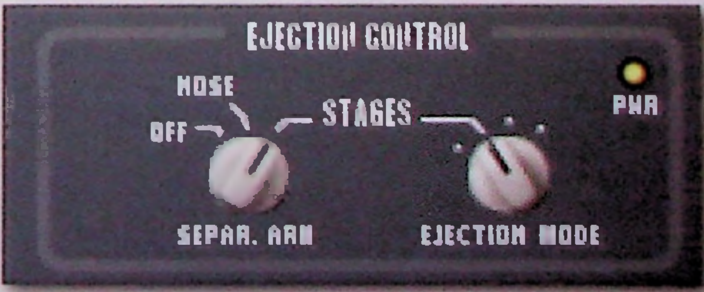


THE MAIN RUNWAY ON ROGERS DRY LAKE AT KEDW IS 39,097 FEET LONG – A WELCOME SITE TO A SPACE SHUTTLE PILOT IF THE WEATHER AT CAPE CANAVERAL IS NOT PERFECT.

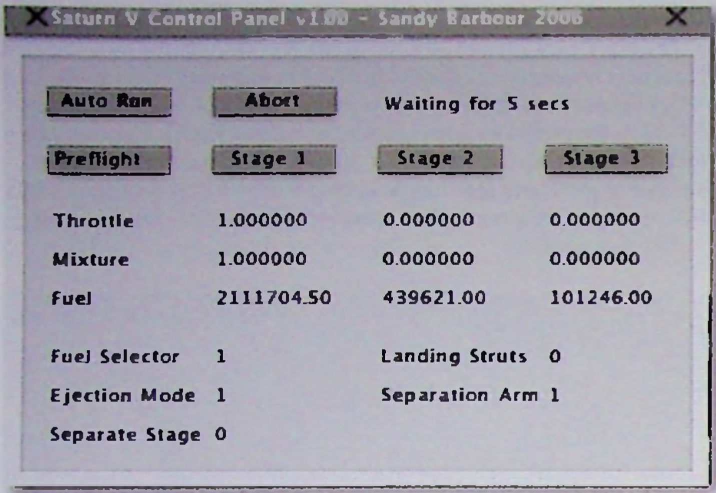
Saturn V

Marcelo Magalhães Marques, of Rio de Janeiro, Brazil has created a wonderful model of the Saturn V rocket system used for lunar missions for X-Plane 7.63. You can download it from x-plane.org and it comes with extensive instructions on how to operate it manually. Since the process requires a lot of skill, I asked Sandy Barbour, one of the authors of the X-Plane Plugin System Developers Kit, to write a plugin to do the job. You can download that at http://www.xpluginsdk.org/ by clicking on "Misc Plugins". All you need to do then is to follow Marcelo's instructions about an immediate pause to adjust the fuel and set two switches. Then open Sandy's plugin and click on "Auto Run".

Remember that Saturn V and the plugin work only with X-Plane 7.63 and be quick about the pause and fuel settings else the ship falls over on its side before getting off the ground.



THESE TWO SWITCHES MUST BE SET AS SHOWN BEFORE LAUNCHING THE SATURN V.



Waiting for 5 secs

Throttle	1.000000	0.000000	0.000000
Mixture	1.000000	0.000000	0.000000
Fuel	2111704.50	439621.00	101246.00

Fuel Selector 1

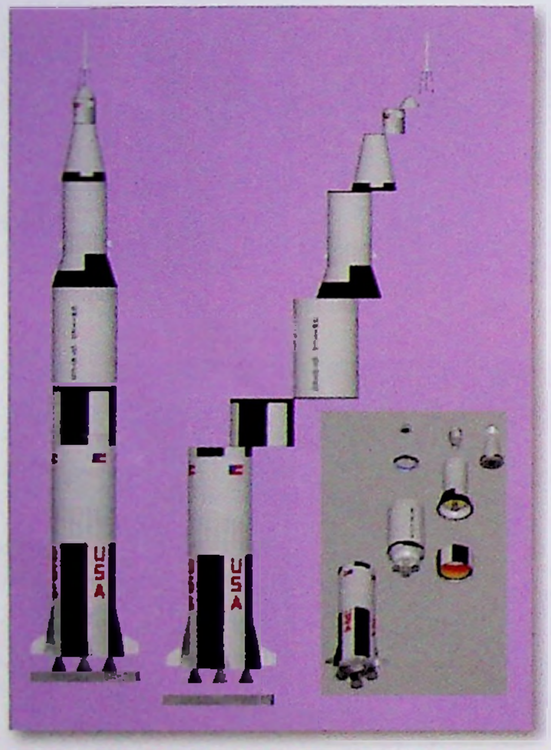
Landing Struts 0

Ejection Mode 1

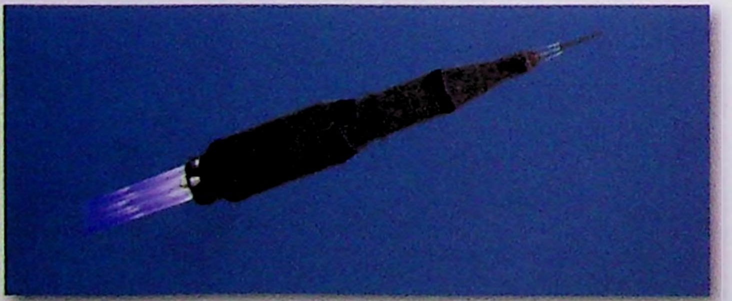
Separation Arm 1

Separate Stage 0

SANDY BARBOUR'S PLUGIN CONTROL PANEL TAKES CARE OF ALL THE LAUNCH CHORES.



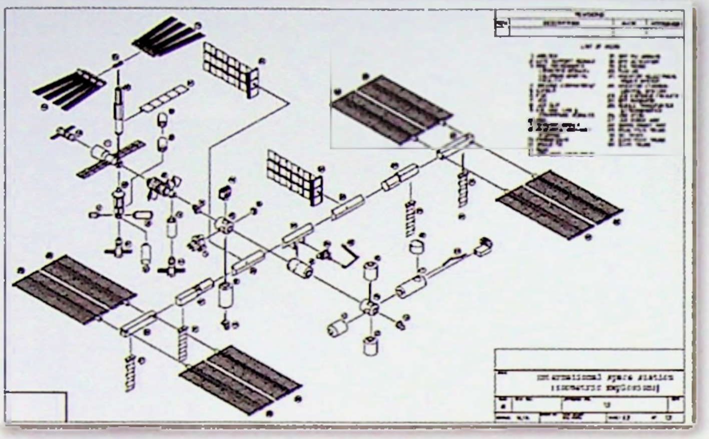
THE SATURN V MODEL HAS MANY PARTS WHICH ALLOW EVEN FOR SHROUDS TO BE DROPPED DURING STAGING. THE OBJECT AT THE BOTTOM IS A LARGE WEIGHT WHICH FORCES THE VEHICLE TO STAND UPRIGHT AT LAUNCH AND IS RELEASED JUST BEFORE LIFTOFF. THE "FUSELAGE" IS THE APOLLO CAPSULE ON TOP. ALL THE OTHER PARTS ARE X-PLANE "WEAPONS".



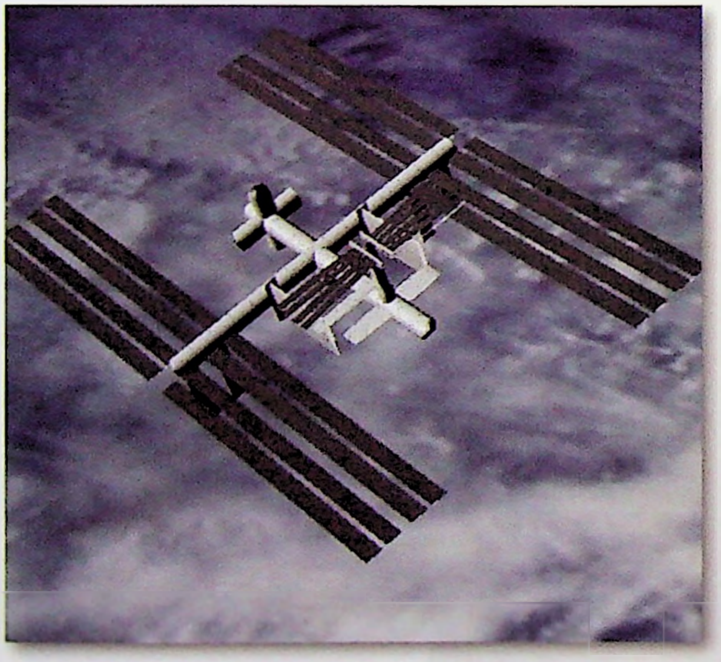
THE FIRST STAGE OF THE SATURN V HAS BEEN EXHAUSTED AND DROPPED.

International Space Station

The ISS, as it is known, is a work in progress. Each mission to it brings new pieces to be added to its ever-increasing complexity and utility. As of Sept. 2006 it weighed 454,240 pounds and had a habitable volume of 15,000 cubic feet. The width across solar arrays is 240 feet, the length is 146 feet from the Destiny Lab to the Zvezda module and 171 feet with a Progress docked. The height is 90 feet. I used these figures and drawings form NASA to construct a rough approximation to ISS in X-Plane 8.50 which you can download from x-plane.org.



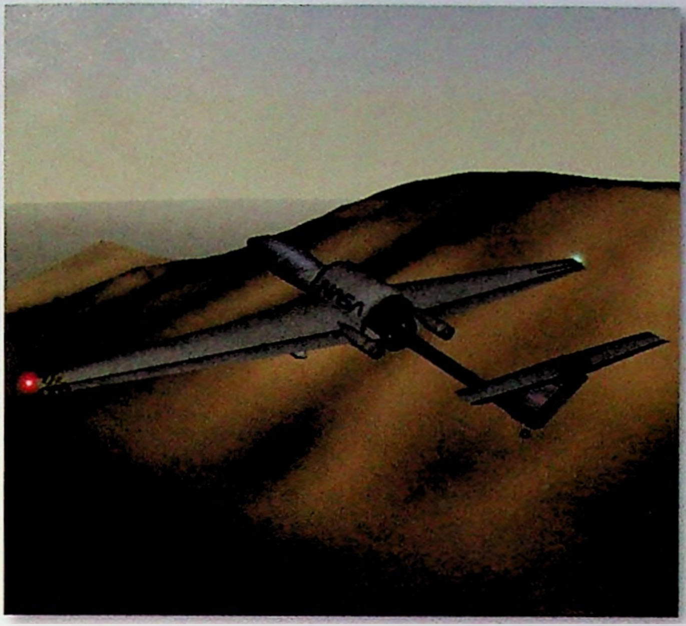
THE ISS CONSISTS OF MANY PARTS WHICH ARE BROUGHT INTO SPACE INDIVIDUALLY AND ASSEMBLED BY ASTRONAUTS.



I USED AS MANY PARTS AS I COULD TO CONSTRUCT THIS X-PLANE MODEL OF THE ISS. THE LARGE SOLAR PANELS CAN BE TIPPED USING THE JOYSTICK.

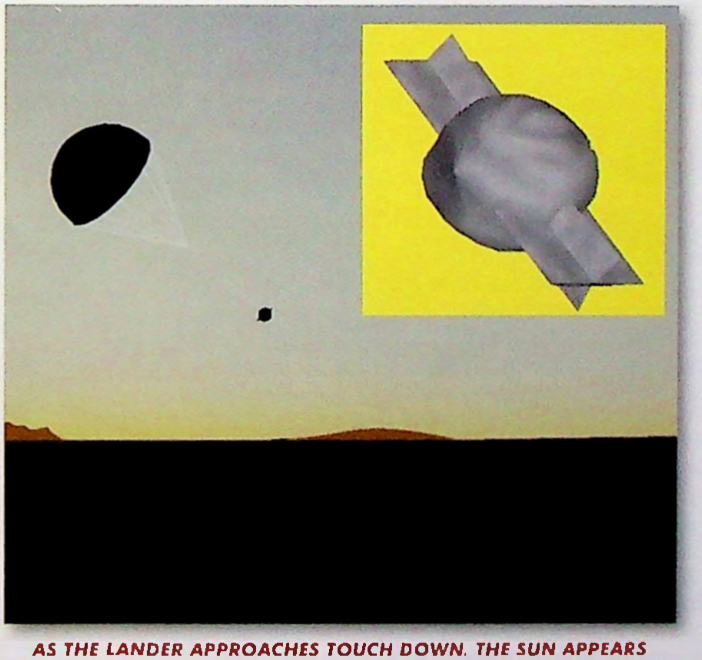
Mars

The low atmospheric density and low gravity make flying on Mars a unique experience. Planes need high lift and look a lot like sailplanes with very large engines to gobble up that thin air.



THIS PLANE THAT COMES WITH X-PLANE CAN FLY IN THE THIN MARTIAN ATMOSPHERE.

Just for fun, I made a simple five-foot diameter sphere fitted with short wings (solar panels?), speed brakes, and a parachute. I placed the vehicle in a low Martian orbit where the density was enough for the chute to have some effect. Sure enough, the Lander was brought to a rough arrival on the surface of the Red Planet. By the way, I didn't see any signs of life.



AS THE LANDER APPROACHES TOUCH DOWN, THE SUN APPEARS SMALLER ON MARS THAN IT DOES FROM THE EARTH.

Different Strokes

Although I started this article with the idea of exploring the capability of X-Plane, I soon found other ways to use my computer for space exploration. Are we having fun yet? ✈

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ANOTHER BORING GUIDED TOUR

by
Captain Mike Ray

Captain Mike Ray is almost obsolete. His career with the airlines left him filled with mountains of worthless knowledge and a willingness to share those pieces of now ancient wisdom with whomever will listen. If you are reading this magazine, and have gotten so far as to even begin to read this article, you are possibly among that rare breed of person who might actually be interested in this stuff. You could even be an airplane addict!
Heck, I've be called worse things.

ANOTHER BORING HISTORY LESSON

(*Rambling musings by Captain Mike*)

In the very beginning of the commercial flying era, before there was complete coverage of the earth by nav aids, GPS, radar and ATC, there was DR: called appropriately enough, "dead reckoning". This DR technique took on the language of the sea and was known as "navigation." For long haul flights, like those across the Pacific, pilots would add an extra person to the flight grew ...they were officially known as the "Navigators."

In the cockpit of the old DC-8s that I was flying in the late sixties, there was an apparatus called an "astrolabe" that had a lengthy periscope device attached to it. The Nav would slip the snoot into an opening in the top of the cockpit with a swooshing sound, and then stand on a little stool on the flight deck and make "star-shots" so we could tell where we were. I remember one Navigator telling the Captain to "*Come one degree left.*"

The Captain responded that he could NOT make such a small correction, so the Navigator says, "*Can you make a four degree correction?*"

"*Of course*," replied the Captain.

"*Then turn five degrees left.*"

When he had made the turn, the Nav says to him, "*Now turn four degrees right.*"

Precision was dicey and the concept of RNP was far in the future. One thing we actually did have, however, was an ILS. Hand flying the ILS in the DC-8 was an exercise in brute force, and every six months we would go to training where, among other things, each pilot would have to demonstrate their ability to hand-fly an engine out ILS approach to minimums, break out and land. WHEEEE! I hated that maneuver.

Today, for all its warts and hickeys, the ILS (Instrument Landing System) is still king. Oh sure, there are contenders, but before there was GPS, FMS, MLS, or RNAV approaches, there was (and still is) the venerable ILS. It is arguably the MOST used approach system in the world and the standard by which all others are measured. Since we are flying sim airplanes whose approach evolutions revolve around the ILS and by far most of the airports in the MSFX and MSFS 2004 databases are ILS, I thought it might be useful to take a look at and get a grip on this useful and proven approach system.

NEARLY BUSTED MY HUMP ONE DARK NIGHT USING THIS SUCKER
THEN

The ILS has it's own development history, and for the sake of brevity, I will spare you the brain numbing details. It might be interesting (to all six of you out there) to mention, however, the evolution of the "precision" enhancements that were made to the original (now called CAT I) approach. The first breakthrough was referred to as the "monitored" approach. Airlines were able, using this technique, to lower the minima significantly WITHOUT enhancing the hardware on either the airplane or the ground transmitter. This became the now famous and sometimes terrifying CAT II MONITORED approach. I flew a bazillion of these two pilot coordinated evolutions on the Boeing 727 using the beautiful FD-109 mechanical flight director. It was a challenging example of early CRM.

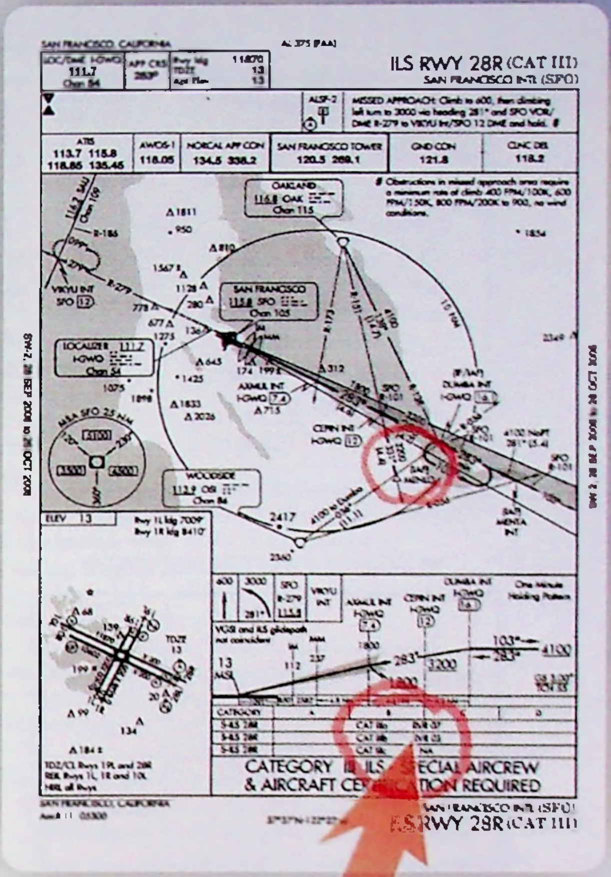
Then the day finally came when CAT IIIb ILS AUTOLAND made its debut. Enhanced airplane systems and ground based improvements made it actually possible to fly the approach all the way to touchdown *without visual cues*. Minimums dropped to as low as 300 RVR (Runway Visual Range) and airports began to reconfigure their runways and support systems to accommodate operating with the reduced visibilities. I am told that Eastern airlines actually retro-fitted some 727 with auto-throttles and autoland. However, my first autoland experience was in the Boeing 737-300 ... and I came to trust that little sweetheart. We would be able to drop out of holding and make an approach while all the other "older" jets would have to remain circling and waiting for the weather to lift. *IT WAS FANTASTIC!!*

All artwork (c) MIKE RAY 2006

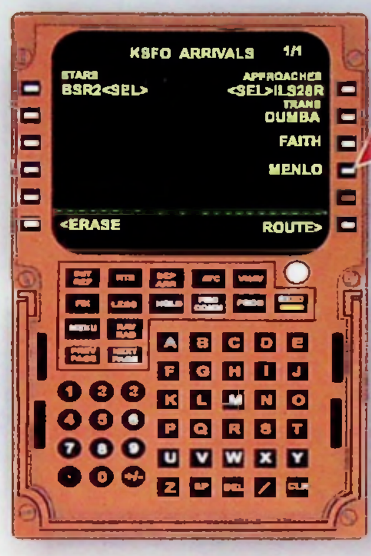
Some more APPROACH PLATE Stuff

Everything you need to know about this approach (almost!).

The ILS approach FINAL APPROACH SEGMENT (FAS) actually begins when the GSIA intercepts the GLIDE SLOPE. What is the GSIA? The GSIA is the officially designated ***"GLIDE SLOPE INTERCEPT ALTITUDE"*** and it is indicated on the approach plate. Even though the airplane may actually intercept the glide slope at a higher altitude than the GSIA, the FAS does not officially begin until after the airplane has descended to or below the GSIA while on the localizer. For our example, I have selected the ILS Runway 28R (CAT III) approach to the San Francisco International Airport (KSFO). Since we have covered briefing the approach plate in a previous lesson, I won't review a lot of that material. I just want to add to what we have and show you some specifics.


SAN FRANCISCO, CALIFORNIA
ILS RWY 28R (CAT III)
SAN FRANCISCO INTL (SFO)
LOC/DME I-GWQ 111.7 Chan 54
APP CRS 283°
ALSF-2
ATIS 113.7 115.8 118.85 135.45
AWOS-1 118.05
NORCAL APP CON 134.5 338.2
SAN FRANCISCO TOWER 120.5 269.1
GND CON 121.8
CLNC DEL 118.2
OAKLAND 116.8 OAK Chan 115
SAN FRANCISCO 115.8 SFO Chan 105
LOCALIZER 111.7 I-GWQ Chan 54
WOODSIDE
CEPIN INT
AXMUL INT
DUMBA INT
MENLO INT
ELEV 13
CATEGORY III ILS - SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED
ILS RWY 28R (CAT III)

Look at the approach plate. One of the designated INITIAL APPROACH FIXES (IAF) is MENLO. When we go to the DEP ARR page of the CDU and we select the 28R runway, we then may select from the database one of the TRANSITIONS labeled MENLO. Unless planning for a specific ARRIVAL, using only the TRANSITION will provide you a computer generated path to proceed directly to the appropriate IAF (Initial Approach Fix).



Now let me try to explain this without getting all screwed up.

Follow me on this, this gets pretty complicated. We know that to properly intercept the ILS, we MUST intercept from a position BELOW the GLIDE SLOPE. That means while we CANNOT descend to an altitude below the GSIA, we may intercept above the GSIA as long as we are below the projected glide slope signal. The minimum cleared to altitude is indicated on the approach plate as a FEEDER ROUTE from the IAF (Initial Approach Fix) to the turn-on point or LOCALIZER INTERCEPT point. This localizer intercept point MUST BE outside the FAF (Final Approach Fix). The Approach plate says that the minimum altitude at the FAF (notch in the feather) is the GSIA (1800 in our example) and since we are going directly to CEPIN from MENLO, we are cleared to 3200 for the intercept. We ARE NOT cleared to descend below the GSIA (see the underline on the 3200) unless on the LOCALIZER.

I have the BIG SUR TWO ARRIVAL chart and it says we cannot descend below 6000 feet until crossing MENLO inbound. Then we can proceed from MENLO on that slightly darker route (called a FEEDER ROUTE) that indicates we are "CLEARED" to proceed from MENLO heading 330 degrees and "CLEARED" to descend to 3200 feet without further ATC clearance. When you depart the IAF on a FEEDER ROUTE you are cleared to turn and descend and intercept the ILS without ATC clearance; ***IF YOU HAVE BEEN CLEARED FOR THE APPROACH.***

SIDEBAR ABOUT AIRSPEED IN CLASS B AIRSPACE

In the US, the FAR (Federal Aviation Regulations) stipulate that whenever airplanes operate in Class B airspace (The area around major airports) that they shall NOT exceed 200 knots.
That includes take-off and landing.
Also, when below 2500 feet AGL and within 4 nm (nautical miles) of an airport in Class C or D (all other airports that are not designated "major" airports) the maximum airspeed is 200 knots.
Exception: If the airplane's minimum maneuvering speed is greater than 200 kts, it is not the intended for an airplane to operate with flaps extended in order to comply.
In NON-US places they will state their airspeed maximum restriction on the approach plate.

CAT IIIb MINIMUMS

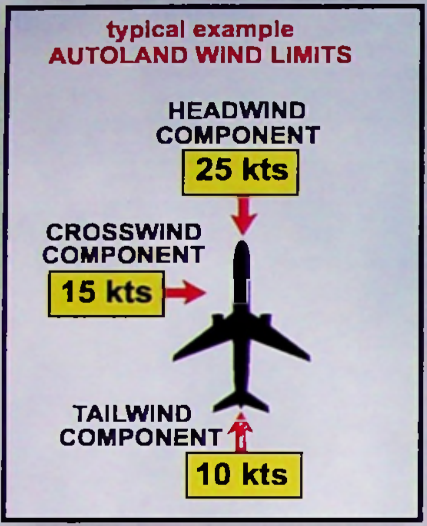
While there is only a single figure in the box, it implies directly that the minimums are:
TOUCHDOWN RVR 300
MID RVR 300
ROLL-OUT RVR 300,
or ATC may report it as "**3, 3, and 3**" or just "**RVR 300**".
We will discuss the details of this in excruciating details in another page of this droning monologue.

So, just to state the obvious: WE should plan our descent to cross MENLO (IAF) at less than 200 kts and no lower than 6000 feet. Leaving MENLO inbound heading 331 degrees, we should descend to 3200 feet and continue to slow and configure the airplane so as to be fully configured by the time we capture the approach at CEPIN and start the FAS at AXMUL.

All artwork (c) MIKE RAY 2006

The magic of AUTOLAND

So Boys and Girls, once the airlines, the Federal agencies, the International fraternities, and a whole bunch of politicians were convinced that the system would work successfully ... it was decided to let airplanes land "*WITHOUT THE PILOT ACTUALLY SEEING THE GROUND.*" We had transitioned to a new world, a new paradigm. The problem with some uninitiated sim-pilot's perception, is that there are much more restrictions and considerations to the situation than mere visual obscuration. Pilots must enlarge their perview to include the NOTAMS (Notice to Airmen), FAA Flyers, ATC circulars, Company publications, periodicals, notes from our Mother, etc and so forth.



There are, of course, always the problems of such things as the wind shifting around and getting to the point where it would compromise safety. There are suggested limits that are "demonstrated" only and don't mean to imply that in an emergency you couldn't actually land with winds greater than these.

Then there is clutter on the runway and precipitation to consider. I have included these charts that are widely used for guidelines in these situations.

Nil Braking action (that means the runways are so slippery, there is NO BRAKING) and the ever popular Microburst offer additional food for thought regarding going somewhere else to land. While some of these situations cannot be simulated in most simulations, it is pretty easy to see that these weather conditions would have a direct effect of the airplanes ability to safely carry out an autoland ... even if everything mechanical was working properly.

RUNWAY CLUTTER CHART

	TAKEOFF NOT PERMITTED	SUSPEND OPERATIONS (except emerg)
SLUSH	OVER 1/2"	OVER 1/2"
WET SNOW	OVER 1"	OVER 2"
DRY SNOW	OVER 4"	OVER 6"
STANDING WATER	OVER 1/2"	OVER 1"

ICING and FREEZING PRECIPITATION

	LIGHT	MODERATE	HEAVY
FREEZING RAIN	OK	NO-OP	NO-OP
FREEZING DRIZZLE	OK	OK	NO-OP
SNOW	OK	OK	OK

"NO-OP" means no operations. We simply are forbidden from flying into moderate freezing rain, for example. WHOOOOOPS! It happens.

BRAKING ACTION NIL

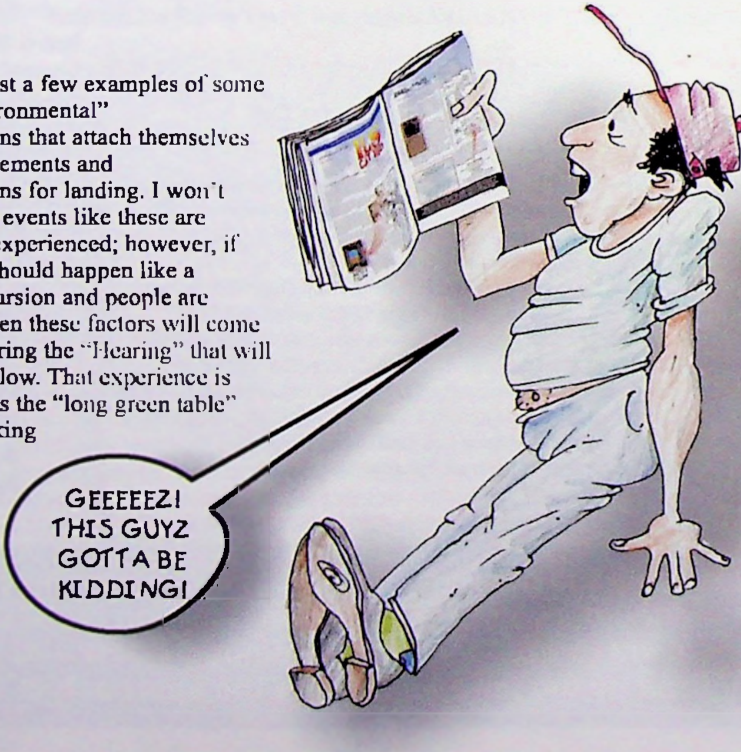
If braking action is NIL:
"TAXI, TAKEOFF, and LANDING NOT RECOMMENDED"

"MICROBURST ALERT"

If a MICROBURST ALERT is broadcast then landings and takeoffs should be terminated until the alert has passed.

These are just a few examples of some of the "environmental" considerations that attach themselves to the requirements and considerations for landing. I won't tell you that events like these are commonly experienced; however, if something should happen like a runway excursion and people are injured ... then these factors will come into play during the "Hearing" that will certainly follow. That experience is referred to as the "long green table" by pilots ...and it is something you do not want to be looking forward to.

Here is a "pet peeve" of mine. There is a real problem of "finding" these limitations. They are hidden in every conceivable nook and cranny of the most obscure regulations they can imagine. Some sources are not even accessible to the airline pilot (or simmer).


GEEEEEZ!
THIS GUYZ
GOTTA BE
KIDDING!

All artwork (c) MIKE RAY 2006

Let's break these requirements and limitations out and see
if we can begin to start to kinda get a handle on understanding the details involved in flying the ILS CAT III approach.

AIRPLANE SYSTEMS:

Somebody in the FAA loves the word 'CATEGORY" and in this approach discussion we will use the word to have at least three different meanings. In other contexts there are also categories and we have to keep them separate. As far as the airborne equipment goes, here is the category chart that assigns the airplane a specific CAT III category.

A BRAND NEW AIRPLANE FROM THE FACTORY.

There are three levels of CAT III minima: These specific airplane types cannot start the approach unless the RVR is equal to or greater than these minimums.

	AIRPLANES (must have AUTOLAND)	RVR	AH/DH
CAT IIIA	Airplanes with AUTOLAND that have a single FMC that restricts centerline roll-out capability; such as 737-300, 400, 500.	600 feet (175 m)	DH 50 feet (15m)
CAT IIIB	Airbus, B747-400, B757, B767, B777 and others equipped with AUTOLAND	300 feet (75m)	AH 100 feet (30m)
CAT IIIC	No airplane types that I am aware of. I don't think this system has been certified for commercial use.	NO MINIMUM	NO MINIMUM

MUST SEE RUNWAY TO LAND (and have adequate RVR)

OK TO LAND WITHOUT SEEING RUNWAY (if adequate RVR exists)

So, here is how I interpret this requirement ... "the 737-300,400,500 MUST have appropriate RVR and *SEE* the runway to land, **ALWAYS**; whereas those other airplane listed above can actually land ***WITHOUT SEEING*** the runway as long as they have appropriate RVR.

A REAL LIFE OPERATING LINE AIRPLANE.

All that chart above is great and wonderful IF everything is exactly like it was when the airplane was certified and everything was working exactly like Mr. Boeing intended, BUT here in the real world, we have to evaluate what REQUIRED aircraft systems are actually operating within certified limits. Well, the genius' over at Boeing engineering realized that we were just pilots, so they made a little indicator for us to stare at during the approach that would monitor all those systems for us.
NOTE: *You non-NG 737 guys are only CAT IIIA, and therefore don't have a system monitor indicator.*

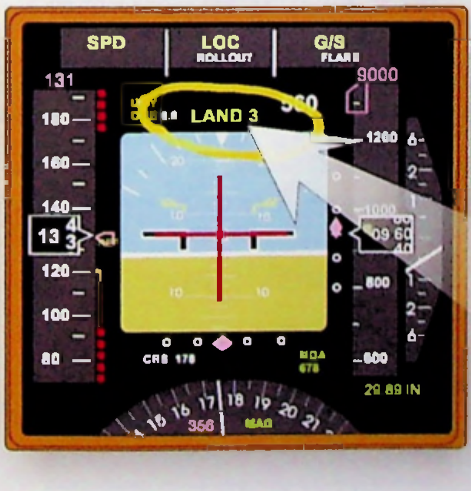
In Boeing "glass" cockpits,
THESE INDICATIONS ONLY OPERATE
BELOW about 1500 feet AGL.

There are actually two sources of information regarding legality of continuing the approach relative to systems available to the Boeing pilot.

1. There is a little indicator in the cockpit that tells the pilot; "ALL IS WELL, CONTINUE THE APPROACH."

BUT

2. There is also a huge list in the Flight Operating Manual which is that nagging voice in the back of your head which says (in spite of the little indicator), *"Not so fast, Ace, have you considered this..."*



"LAND 3" indicator on the NG aircraft

757/767 "ASA" INDICATOR

CAT IIIB	AUTOBRAKES - REQ (or IRS Ground speed) ANTISKID - REQUIRED REVERSERS - REQUIRED ROLLOUT GUIDANCE REQUIRED

Partial list of required CATIIIb equipment from the Flight Operations Manual

30 DAY REQUIREMENT

A final consideration is "CURRENCY REQUIREMENTS." The airplane MUST actually fly a CAT III AUTOLAND within the last 30 days or the equipment is "DEGRADED" to a lower status. What this means to the pilots is that they MUST check the maintenance records and ensure that the airplane is flown and landed to adequate CAT III specifications during the 30 day period. This also means that even though the weather may be CAVU (Ceiling And Visibility Unlimited) the pilots may be REQUIRED to fly a CAT III AUTOLAND approaches just to maintain system currency.

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GROUND BASED SYSTEMS:

You will have to take my word for it, that the incredible back-up and ancillary systems required for an airport to be "CAT IIIb" capable is well beyond the scope of this article. Here are just a few of the things they have to do:

- GROOVED RUNWAY SURFACE to ensure residual moisture does not collect on the surface.
- MICROBURST DOPPLER RADAR
- SNOW (CLUTTER) removal equipment on standby
- ALSF style approach light systems
- TOWER GROUND RADAR for monitoring taxi patterns during low or non-existent visibility.
- SECURITY and TRAINING ISSUES
- and the list goes on and on.

For the pilots there are only a few of the huge number of complex ground based mechanisms that we are directly concerned with.

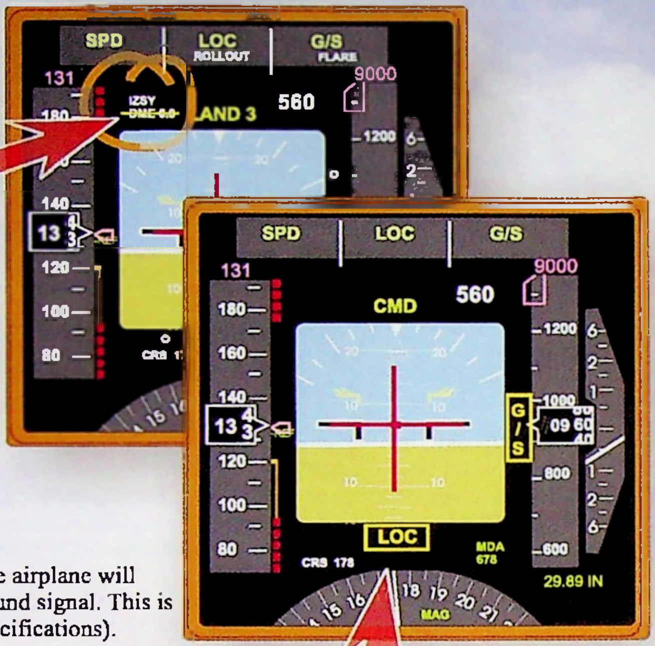
- RVR TRANMISSOMETERS
- GLIDE SLOPE
- LOCALIZER
- APPROACH LIGHTS at the approach end
- TAXI OFF LIGHTS at the rollout end

and a whole host of minute details like that.

LOSS of GROUND SIGNAL:

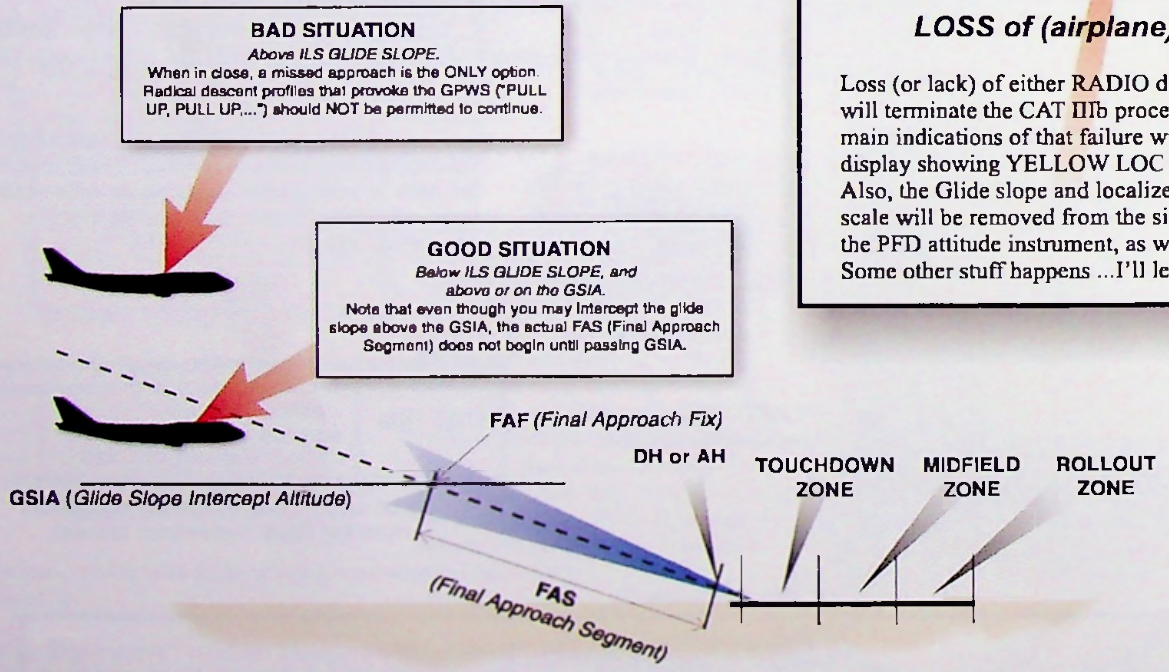
Loss (or lack) of the ILS signal means that the ILS approach is over. You cannot continue and must execute a missed approach or "go-around." The indication of a loss of signal would be dramatically displayed on the PFD. On most airplanes, a "YELLOW BAR" appears across the radio frequency, or radio frequency cluster.

If you experience "LOSS OF SIGNAL" during the approach that persists for more than about 30 seconds you must consider a missed approach. In general, a temporary signal loss in not all that uncommon. Usually the caused is another airplane taxiing across the ILS transmitter pathway, blocking the signal.
The airplane ILS system is constructed so that during the approach, it has been sampling the wind, speed, etc and will continue to fly the approach predicated on its "memory" of the previous portion of the approach. In fact, if you are below 200 feet AGL, you may continue the approach and the airplane will FLARE-RETARD-ROTATE-ROLLOUT right on schedule without the ground signal. This is 200 feet is an altitude subject to specific airline OP SPECS (operational specifications).



LOSS of (airplane) RADIO:

Loss (or lack) of either RADIO during the approach will terminate the CAT IIIb procedure. One of the main indications of that failure will be the PFD display showing YELLOW LOC and G/S BOXES. Also, the Glide slope and localizer indicators and scale will be removed from the sides and bottom of the PFD attitude instrument, as well.
Some other stuff happens ...I'll leave it at that.


BAD SITUATION

Above ILS GLIDE SLOPE.
When in close, a missed approach is the ONLY option. Radical descent profiles that provoke the GPWS ("PULL UP, PULL UP,...") should NOT be permitted to continue.

GOOD SITUATION

Below ILS GLIDE SLOPE, and above or on the GSIA.
Note that even though you may intercept the glide slope above the GSIA, the actual FAS (Final Approach Segment) does not begin until passing GSIA.

This diagram illustrates the desired position of the airplane relative to the localizer beam during the interception. This "HIGH" situation would be indicated in the cockpit by the LOCALIZER INDICATOR being below the middle dot on the localizer scale. After flying a perfectly good intercept, a common reason simmers get in that position is that they haven't armed the APP (Approach mode of the autopilot). Once you have significantly deviated from the glide-slope on the high side, it is virtually impossible to descent to a point where re-capture can occur. Some Airlines have a 1000 FPM MAXIMUM descent rate above 500 feet AGL.

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The RVR riddle:

The ILS system has three transmissometers located in the immediate vicinity of the landing runway. These devices are capable of determining the visibility to a high degree of accuracy. They are called:

TOUCHDOWN RVR(located by the touchdown zone)
MIDFIELD RVR (located mid field)
ROLLOUT RVR (located at the rollout end of the runway).

These are the sources for the RVR minima that control the approach.

Now here is the really difficult part of this whole thing, these RVR numbers are constantly being transmitted when the visibility get really low and the pilots will monitor them continuously as they come down the chute, using the ATIS and the TOWER.

These numbers are important because they tell the pilots whether or not they are "legal" to

A- start the approach continue, or
B- Continue the approach to a landing.

Here is an example to help clarify the point. If you are flying an airplane classified as CAT IIIb capable (such as a 747-400) then you may begin the FAS (Final Approach Segment) where GSIA intercepts the glide slope ONLY if you have adequate RVR.

Once established in the descent you are cleared to descend to the missed approach point (Alert Height or AH in our case), but you MAY NOT descend below the AH unless when you get there the RVR is meets the criteria for minimums or RVR 300-300-300. Even if you SEE the runway, you must go around if ther RVR is below minimums.

BUT

If you have adequate RVR, even though you can't see the runway, you are cleared to land in a CAT IIIb capable airplane.

How to determine LEGAL RVR

Use this little chart to help out.

ENTER THE CHART WITH THE TOUCHDOWN RVR ...

Welcome to the world of the CAT IIIb approach.

IF TCHDN RVR IS.........THEN THESE ARE THE RVR REQUIREMENTS

	RVR/CAT	TCHDN	MID	ROLLOUT	RVR NOTES*
DOWN TO but NOT less than 1800	CAT I	REQUIRED CONTROLLING	OPTIONAL ADVISORY	OPTIONAL ADVISORY	MID CAN SUB FOR TCHDN IF INOP
DOWN TO but NOT less than 1600	CAT II	REQUIRED CONTROLLING	OPTIONAL ADVISORY	OPTIONAL ADVISORY	
DOWN TO but NOT less than 1200	CAT II	REQUIRED CONTROLLING	OPTIONAL ADVISORY	REQUIRED ADVISORY	MID CAN SUB FOR ROLLOUT IF INOP
DOWN TO but NOT less than 600	CAT IIIA	REQUIRED CONTROLLING	REQUIRED CONTROLLING	REQUIRED ADVISORY	IF ONLY TWO, BOTH CONTROL
LESS THAN 600	CAT IIIB	REQUIRED CONTROLLING	REQUIRED CONTROLLING	REQUIRED CONTROLLING	ONE CAN BE INOPERATIVE

The FABULOUS but almost impossible

RVR GAME

1. Make up some RVR cards. You will need at least 3 from each possible RVR reading. Examples below.

1200	1200	1200	1200	1200
600	600	600	600	600
300	300	300	300	300
200	200	200	200	200
ZERO	ZERO	ZERO	ZERO	ZERO

2. Cut out the RVR cards. You can then place them in a hat or an old peanut can.
3. As you are approaching the GSIA, select three cards at random and note the value in the order you draw them out. Put cards back in the hat.
4. Decide if you can START the approach.
5. After leaving the GSIA and after you pass 1500 feet, select three more cards. Note the values in the order you pick them out.
6. Decide if you are legal to land.

PS: No fair using the "P" (pause) key.

SOME SAMPLE SITUATIONS:

If the RVR goes from 6 - 6 - 6 to 6 - 6 - 0: Can we continue the approach?
The answer is "YES." Why? , because as long as the TCHDN RVR is 600 RVR OR ABOVE , then the ROLLOUT RVR (while required) is only advisory.

If the RVR goes from 6 - 6 - 6 to 12 - 0 - 0: Can we continue?
The answer is "YES." Why? because if the TOUCHDOWN RVR is 1200 or greater, then the MID RVR is optional/advisory and the ROLLOUT is required but advisory.

If the RVR goes from 3 - 3 - 3 to 3 - 3 - 0?
Then a go-around MUST be executed even though the RUNWAY IS IN SIGHT!

If the Controller says the RVR is 1200, and doesn't specifically mention a ROLLOUT RVR, can we continue?
Answer: Yes. Why? Because MID and ROLLOUT RVR are only reported when less than TOUCHDOWN RVR

If MID RVR is INOPERATIVE, and RVR is TCHDN 300 and ROLLOUT 300, can we continue?
Answer: Yes. Why? If RVR reported is below 600 RVR, then one RVR can be inoperative.

If weather is 1200 - 0 - 0. Can we?
Answer: Yes. Why? If RVR 1200, then MID and ROLLOUT are advisory only.

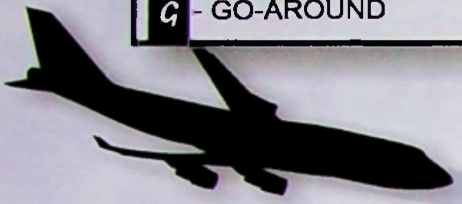
These samples are reprinted by permission from Captain Mike Ray's "Unofficial Boeing 757/767 Simulator Check-ride Manual." Available at www.utem.com.

All artwork (c) MIKE RAY 2006

typical
ILS CAT IIIb APPROACH
using AUTOLAND

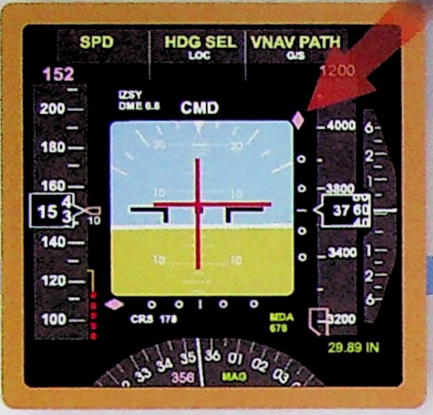
APPROACHING PATTERN

- **A** - ATIS
- **I** - INSTALL APPROACH
- **R** - RADIOs (tune & Ident)
- **B** - BRIEF
- **A** - APP-DESCENT CKLIST
- **G** - GO-AROUND



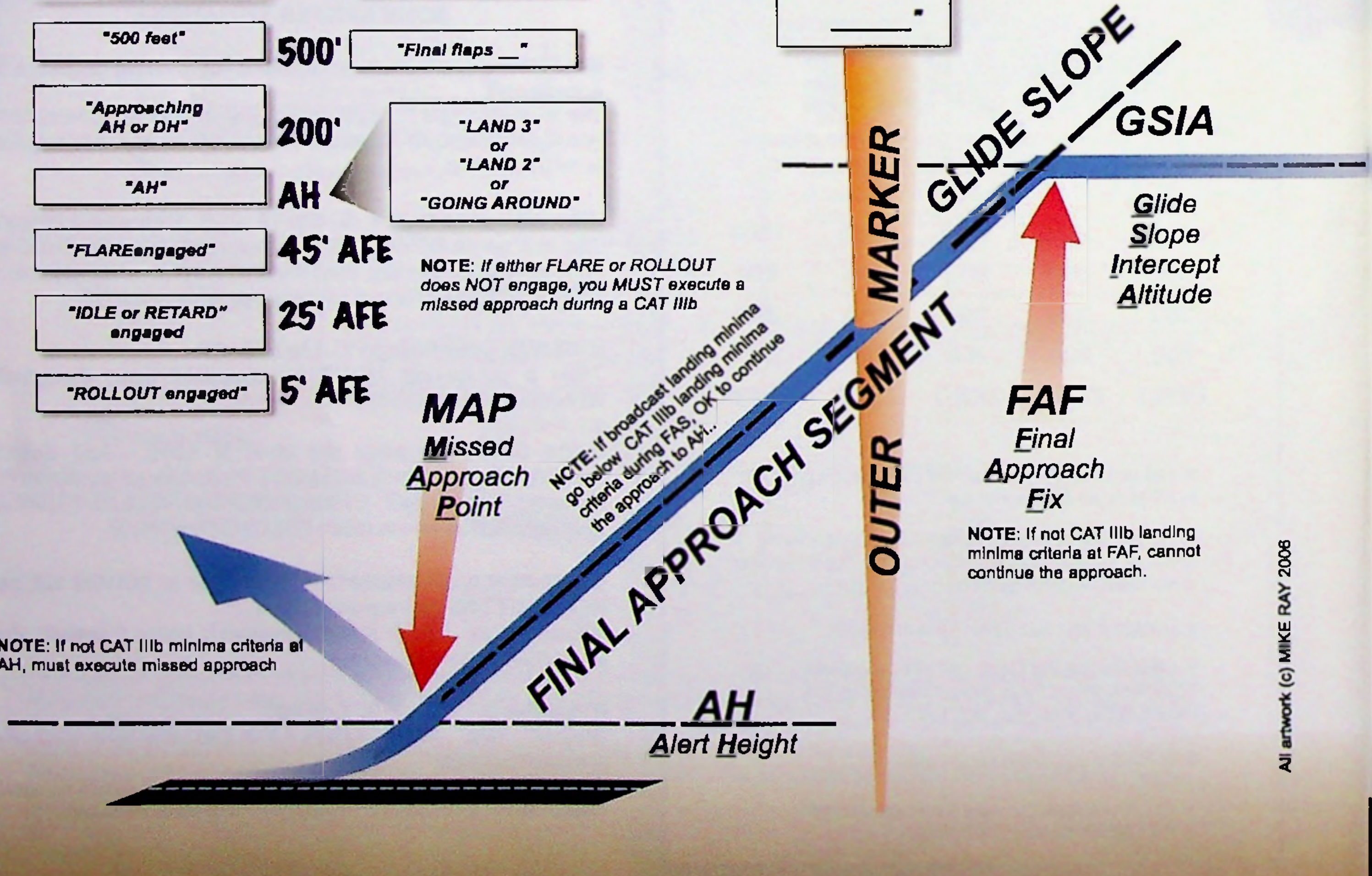
Within B class airspace, 200 KTS maximum (US).

DO NOT select the APP (Approach mode on the autopilot) until the glide-slope and localizer indices appear on the PFD.



F/O		CAPT (responds)
"LAND 3/2" "FLARE and ROLLOUT and FLARE ARMED"	below 1500'	
"1000 FEET Instruments Crosschecked"	1000'	"Runway ____, cleared to land"
"500 feet"	500'	"Final flaps __"
"Approaching AH or DH"	200'	"LAND 3" or "LAND 2" or "GOING AROUND"
"AH"	AH	
"FLAREengaged"	45' AFE	
"IDLE or RETARD" engaged	25' AFE	
"ROLLOUT engaged"	5' AFE	

NOTE: *If either FLARE or ROLLOUT does NOT engage, you MUST execute a missed approach during a CAT IIIb*



NOTE: If broadcast landing minima go below CAT IIIb landing minima criteria during FAS, OK to continue the approach to AH...

NOTE: If not CAT IIIb landing minima criteria at FAF, cannot continue the approach.

NOTE: If not CAT IIIb minima criteria at AH, must execute missed approach

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NOTES

- ***THE AUTO-LAND IS A MULTIPLE AUTOPILOT MANEUVER.***
- ***DO NOT try to AUTOLAND ON A SINGLE AUTOPILOT.***
- ***DO NOT AUTOLAND ON A RUNWAY THAT IS NOT CAT II or CAT III*** CAPABLE.
- FAF is (USUALLY) INTERSECTION OF GSIA and GLIDE SLOPE.
- WX MUST BE AT or ABOVE MINIMUMS TO CONTINUE PAST GSIA.
- IF WX GOES BELOW MINIMUMS ONCE PAST FAF; OK TO CONTINUE TO MAP; BUT, you CANNOT LAND CAT III UNLESS RVR LEGAL (*Even if you see the runway*).
- ***OK to AUTOLAND with ONE ENGINE INOPERATIVE.***

DOWNWIND LEG

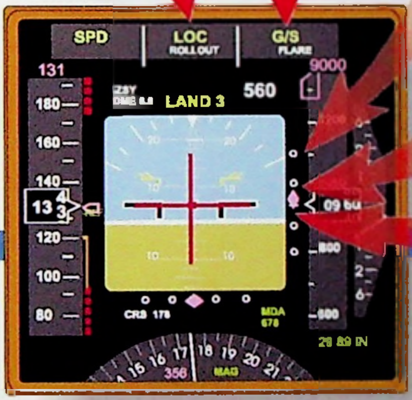
MONITOR PFD
and *when*
LOC and G/S go from
WHITE (armed) to GREEN (capture)
then set MCP up for Missed Appch:
M/A ALT and M/A HDG (if req)

FLAPS 10
slow to flap 10 speed + 10 KTS

If on Engine out;
Terminate fuel transfer

AT TOP DOT
"FLAPS 10"
FL10 + 10 KTS

CROSSWIND LEG



AT LOWER (middle) DOT
"GEAR DOWN"
"FLAPS 20"
"FINAL DESCENT CHECK"

INTERCEPT LEG
(usually about 30° to the final course)

Approaching GLIDE SLOPE
"LANDING FLAPS"
"TARGET AIRSPEED (usually

"CLEARED FOR APPROACH"
you MUST do **2** things
1. **ARM the APPROACH MODE;**
   Push "**APP**" on MCP
NOTE: A nice touch is to push "LOC" until LOC CAPTURE; then push "APP" to avoid early descent outside of protected airspace.
2. **ARM OTHER (TWO) AUTOPILOTS.**

USE ND OK IN EITHER APP or MAP MODE

The PFD is considered the PRIMARY NAVIGATION INSTRUMENT.

CDU in LEGS PAGE for distance to waypoints

USE AUTOPILOT/AUTOTHROTTLE

EVEN WITH AN ENGINE FAILURE, it is OK to USE AUTO-PILOT TO FLY APPROACH and AUTO-LAND.

For some inexplicable reason, this is ***EASY TO FORGET*** !
You should NOT autoland using single autopilot.

All artwork (c) MIKE RAY 2006

ROUNDROBIN ADVENTURE

OKANAGAN WINE VALLEY TOUR

BY AL PELLETIER

If you have undertaken previous Round Robins, skip the next paragraph, jump right in, and have fun. For those who are new to this, Round Robins are published with the intent of having Flight-Simmers fly, look at the scenery, refresh our geography, practice our cross country navigation, perform approaches at different airports all over the world, and have some FUN. In the message, you will be receiving info like: airport departure and runway number, VORs and NDBs enroute, two or three middle airport destinations, for VFR or INST approach, and back to your point of departure (Round Robin). You will also be given ILS and LOM freq., minimums, procedures etc. and a little background on the geography of the area. After you fly a few of these, you will have a much better command and understanding of the different types of published procedures. You will learn to handle a lot of information in a very short time, while still maintaining control of your aircraft.

Round Robin adventure: Okanagan Wine Valley tour. This route is based on a true charter flight. The idea for this article came to me after vacationing in Oliver, BC, Canada. Oliver is known as the wine capital of Canada and is gaining worldwide recognition for its top-class vineyards and wineries. I was parked, in my RV trailer, right next to the small airport of Oliver. I watched, daily, as Pilatus PC-12s flew in and out, bringing in clients for wine tours, which are very popular, every year during the month of September, culminating into the "Wine Festival" in early October.

Jeff Smith, at Flight1 software, was kind enough to provide me with a Pilatus PC-12 aircraft for FS2004, and what a gem this one turned out to be! One of the finest single prop airplane I have ever flown in Flight Sim.

Great add-ons for this flight:

(Most freeware files can be found at www.flightsim.com or www.avsim.com)

Aircraft and Panel (Payware):

I used the Pilatus PC-12 from Flight1. (www.flight1.com)

Scenery (Payware):

Again I was spoiled by my good friend Justin Tyme at FSGENESIS with awesome textures for Western Canada. (www.fsgenisis.net)

Scenery (Freeware):

- Land Class for the total BC interior (BC_LANDCLASS.ZIP) by Martin Olridge.
- CRANBROOOK Airport (CYXC04.ZIP) by my good friend Vern Opperman.
- KELOWNA CYLW LANDCLASS (KELOWNA-LANDCLASS.ZIP) by Bryan York.
- BC Mesh (BCMESH9D.ZIP) by Holger Sandman.
- KELOWNA Airport (CYLW2K4.ZIP)by Dean Kenyan.

Aircraft (Freeware):
Pilatus by the AFG team (AFG_PC12_BASEPACK.ZIP). Great package!

More Aircrafts and panels: There are also numerous freeware Pilatus PC-12 in many liveries available at **www.avsim.com** and **www.flightsim.com**

(A lot of notes regarding ATC will pertain only to FS2002\FS2004 users)

May I suggest, that you READ the route a couple of times before starting out, so that you'll have the flight plan fairly clear in your mind. Especially in a fast medium or large jet aircraft, there isn't much time to spare and definitely no room for errors.

The scenario and tasking for this exercise: We are flying a Pilatus PC-12 for a Charter company, and today our passengers are bound for the Okanagan Valley in the British Columbia interior. This is a true to life flight with the PC-12, although the Cranbrook departure is probably fictitious. The first 2 legs of the flight terminate in VFR conditions and the last 2 legs in IFR conditions.
Of course, you can change the conditions as you wish, and make it even more challenging in the process.

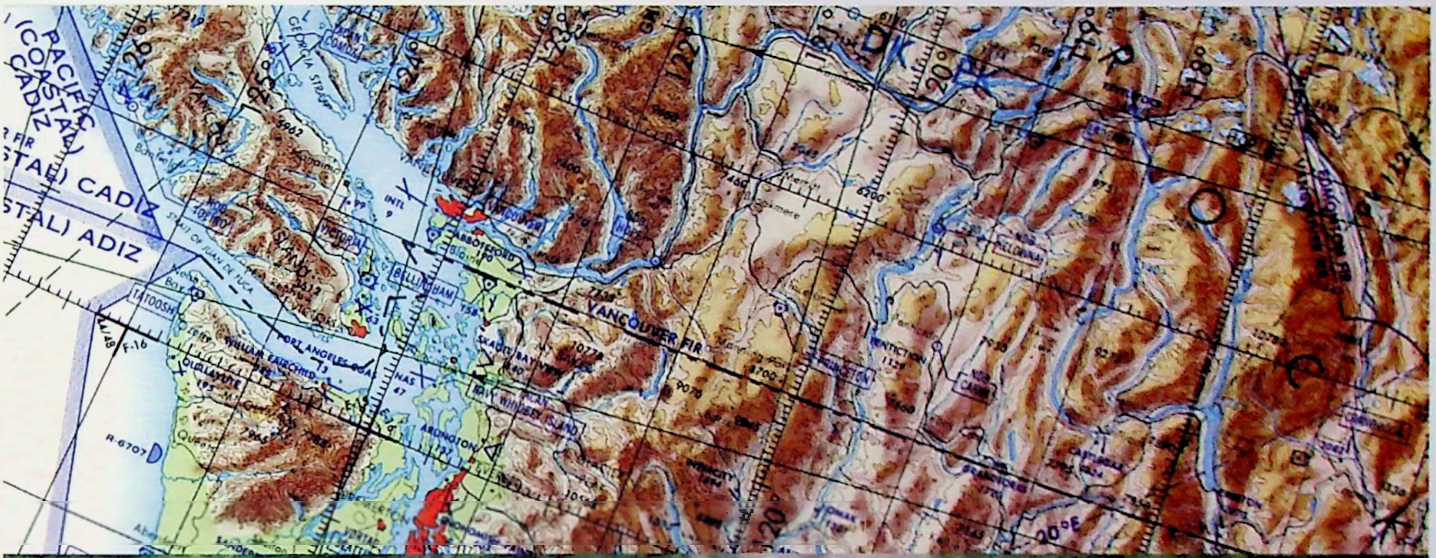
Round Robin Adventure:
CRANBROOK BC (CYXC) >>>
OLIVER BC (CAU3) >>>
PENTICTION BC (CYYF) >>>
KELOWNA BC (CYLW) >>>
CRANBROOK BC (CYXC).
Approx total distance: 400 nm.

NOTE: For the purpose of these exercises, we will assume that we are receiving Radar vectors to different VORs or ILS interception points. In the "Real" world of today, aircraft usually receive vectors to the interception points, to ensure proper separation. I'm also assuming that you will have a good look at the Approach plates for each segment.

One more note. If you are using ATC for takeoff, taxi and landings, you might be given different RWY or taxi way, depending on the weather. You might even input the whole trip in a FS flight plan and fly it that way.

"Check out the high res maps in the "Download area" before you start out"

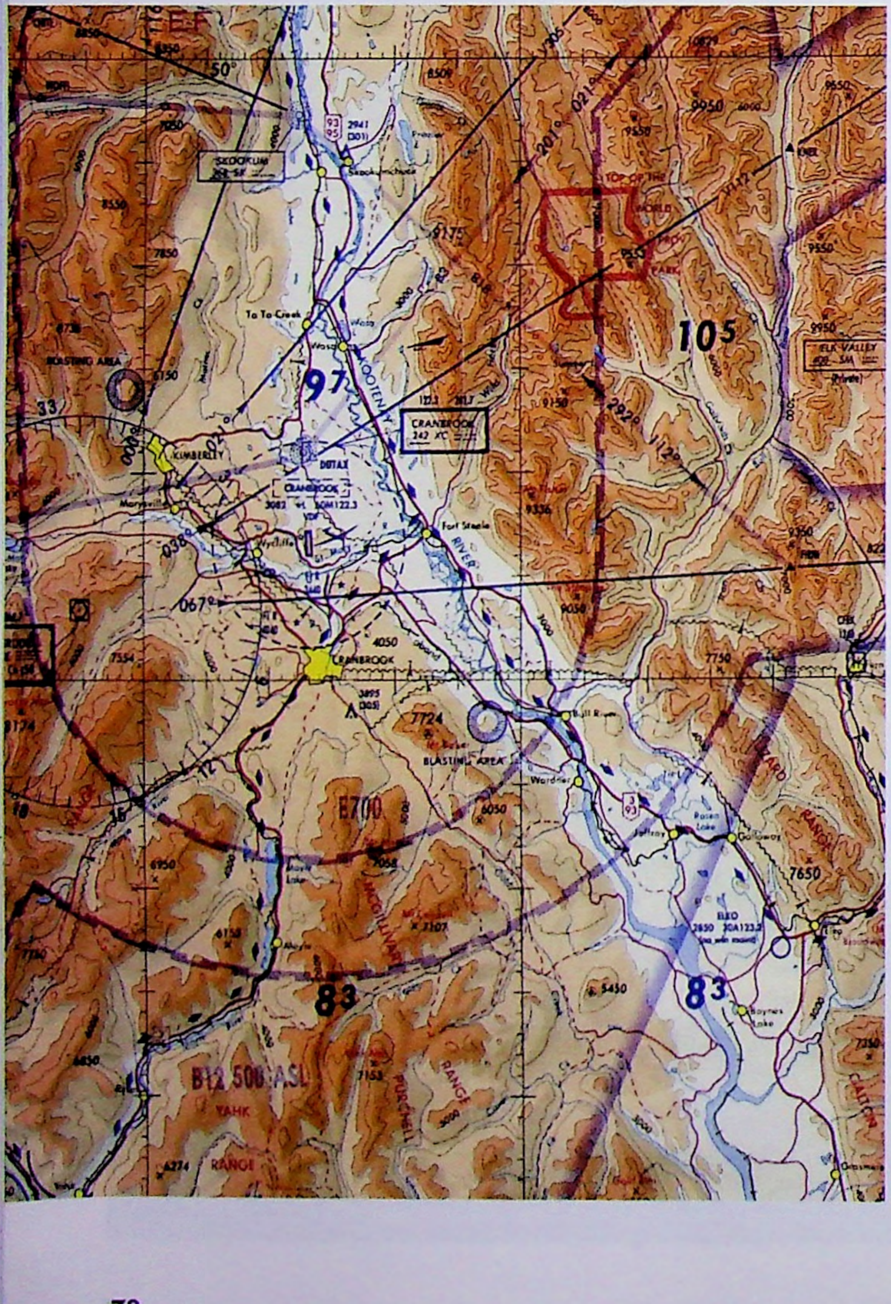
BEGIN

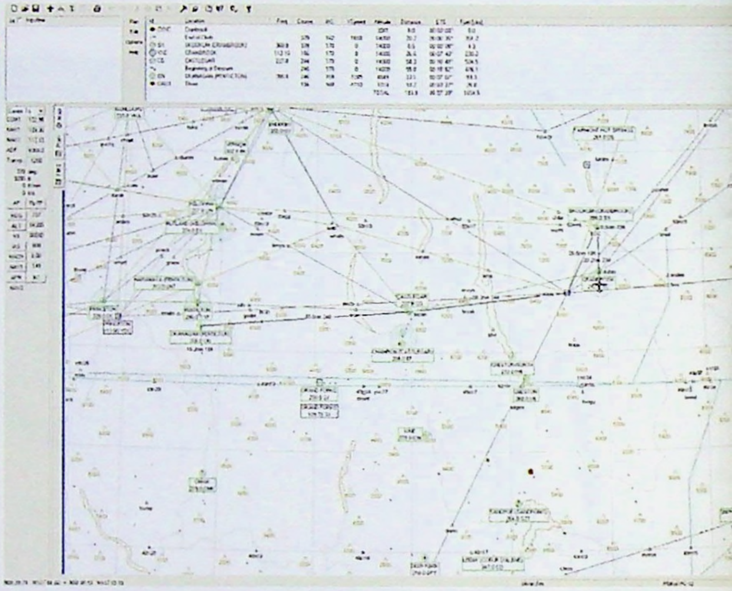


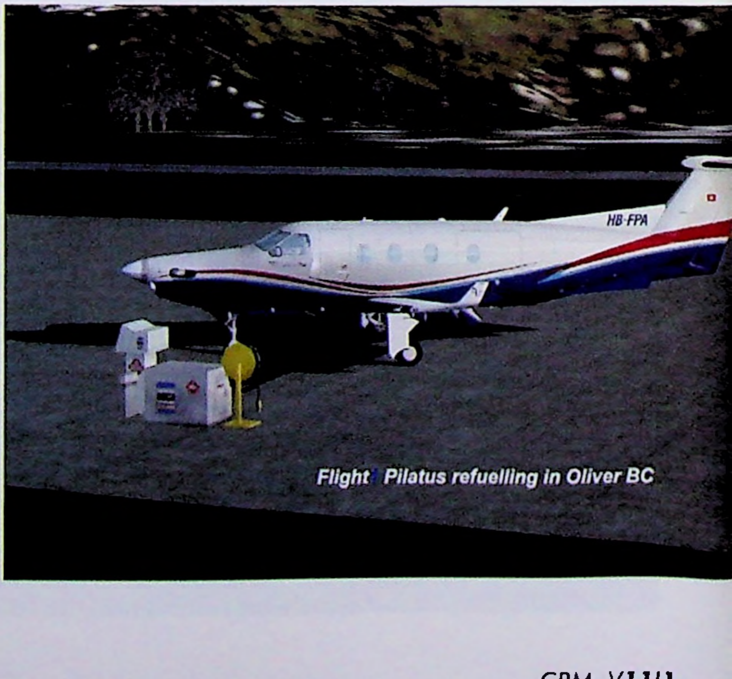
First leg: CRANBROOK (CYXC) >>> OLIVER (CAU3) Approx 194 nm.

- Clock to 0900L, season early fall. Weather at your discretion.
- Dial in the CRANBROOK (YXC) VOR frequency 112.10 on NAV 2 and tune in the SKOOKUM (SX) NDB frequency 368 on the ADF.
- Taxi to and T/O (Take Off) RWY 34, climb RWY Heading to 14,000 and home the SX NDB to on top. (Max rate of climb. You need to be at 9000 over the NDB).
- On top the NDB turn left HDG 186 and track the Cranbrook VOR to on top.
- On top the VOR, turn right HDG 244. Tune in and home the CASTLEGAR (CG) NDB frequency 227 to on top.
- Dial in the PRINCETON (YDB) VOR frequency 113.90 for DME info.
- Over the CASTLEGAR NDB turn right HDG 248, tune in and home the OKANAGAN (ON) NDB frequency 356 (no reception for 38 nm. Keep the PRINCETON VOR just 5 degrees to your starboard side. This should keep you right on track).
- 65 nm out of the PRINCETON VOR begin descent to 9000.
- 37 nm out of the PRINCETON VOR begin descent to 5000.
- Over the OKANAGAN NDB turn left HDG 156. The Oliver airport is 10 nm straight ahead. Maintain VFR, as this is a very mountanous area.
- 5 nm back, you are cleared for a full stop to RWY 18 at Oliver (Elevation 1013, RWY length 3200). Check gear down.

Land at Oliver and back track to terminal located on the NW side of the airport. Our passengers will be here till 1400L.





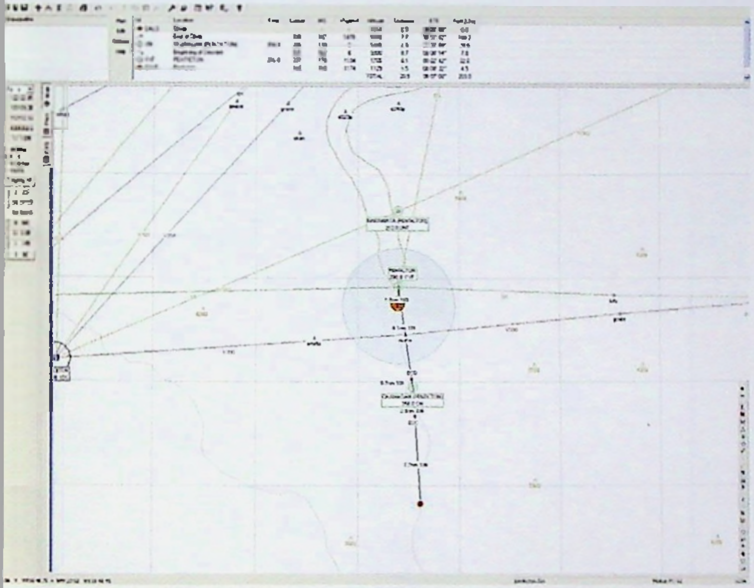


Flight1 Pilatus refuelling in Oliver BC

Second leg: Oliver (CAU3) >>> PENTICTON (CYYF) Approx: 21 nm.

- Clock to 1415L.
- Tune in the OKANAGAN (ON) NDB frequency 356 on the ADF.
- After your PAX are loaded, taxi to and T/O RWY 36 left climbing turn to 5000, HDG 336 and home the ON NDB to on top.
- On top the ON NDB, tune in and home the PENTICTON (YYF) NDB frequency 290, and begin descent to 3000 for a visual approach to RWY 34. The airport is located at the North end of the lake 7 nm past the OKANAGAN NDB. (Penticton RWY 34 length 5770, elevation 1128. There is an ILS to RWY 16. Frequency 110.3, course 160, in case you want to come around from the North. It isn't published as a back course ILS to RWY 34 because it would put you in a danger area over mountains).
- 5nm back, you are cleared for a full stop to RWY 34 at PENTICTON airport. Check gear down and locked.

Land at PENTICTON and take first left to terminal.

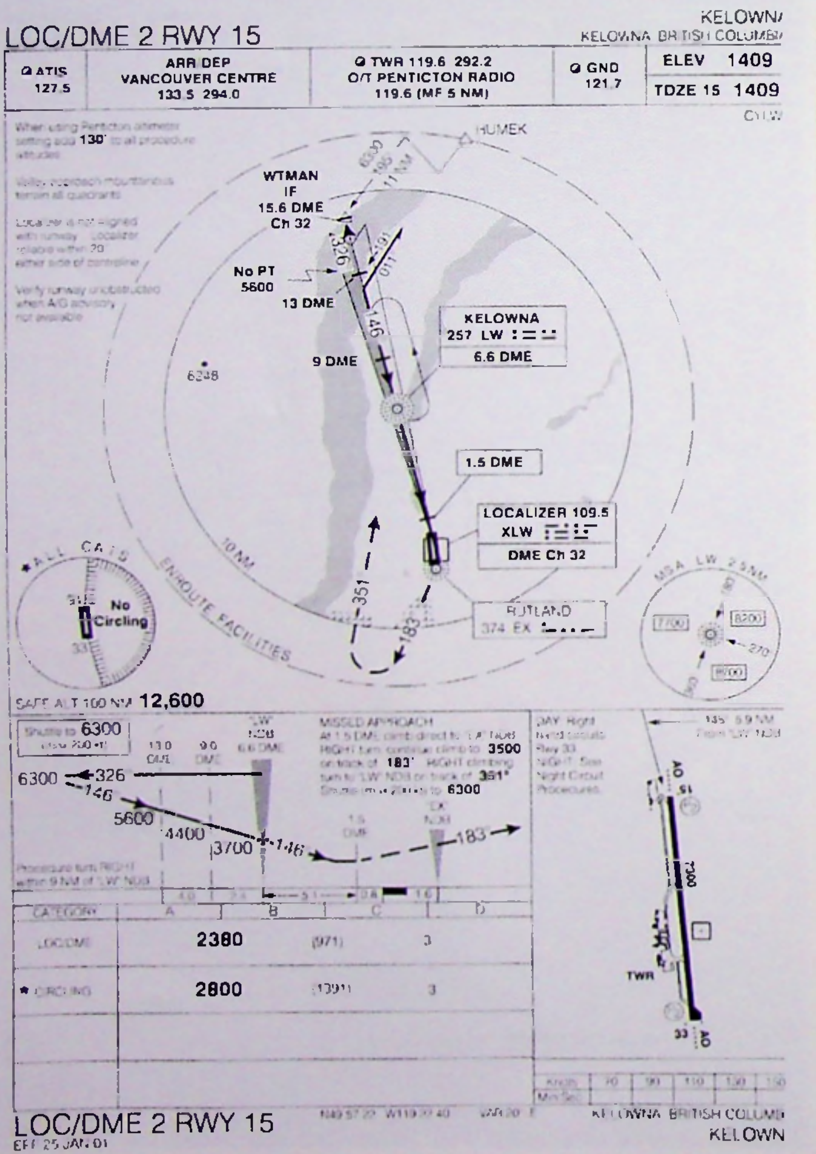


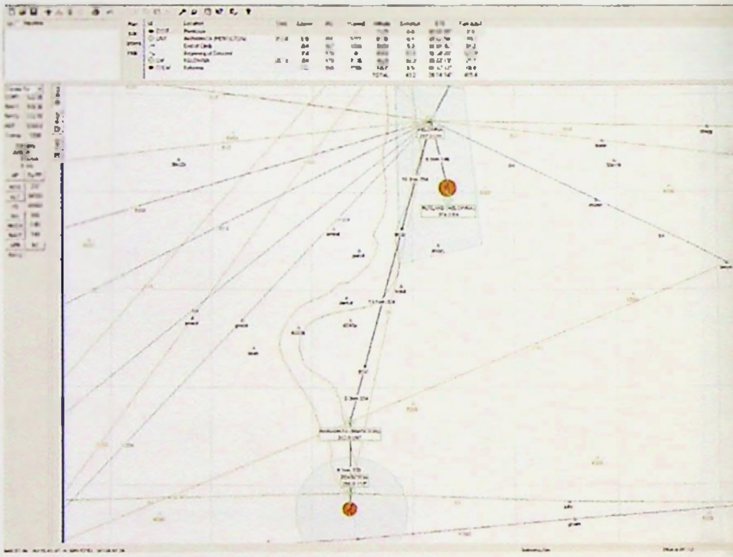
Penticton Airport BC Canada RWY 34
Photo by Al Pelletier

Third leg: PENTICTON (CYYF) >>> KELOWNA (CYLW) Approx: 996 nm.

- Clock to 1600L.
- Weather: Overcast conditions 8/8 based 2500, visibility 3 nm in moderate rain, wind 200/5 (If you pick "Gray and Rainy from the Weather main menu, it will be almost right on).
- Tune in the NARAMATA (UNT) NDB frequency 312.
- Taxi to and T/O RWY 34, home the UNT NDB and climb to 8000.
- Over the UNT NDB, turn right HDG 354. Tune in and home the KELOWNA (LW) NDB frequency 257 to on top.
- Enroute, dial in the LOC XLW frequency 109.5 and set course 146 on your NAV 1 OBI. Also tune in, on the STBY ADF, the RUTLAND (EX) NDB frequency 374 in preparation for a LOC/DME approach to RWY 15 at Kelowna (Actual RWY course 150, RWY length 7300, elevation 1409). This is a 5 degrees offset approach.
- On top the LW NDB, turn left HDG 326 and descend to 6300.
- 15.6 DME (off the XLW localizer) turn right HDG 011 and maintain for 90 seconds, followed by a left hand turn to HDG 191 to intercept the localizer. The turn on the localizer should happen when your ADF needle (LW NDB) is pointing to 146 deg. You should fly over the LW NDB inbound at 3700 altitude.
- Continue with the approach (offset by 5 degrees).
- 5 nm back, you are cleared for a full stop to RWY 15. Check gear down and locked.

LAND at Kelowna airport and take first right to terminal.





ILS to Kelowna

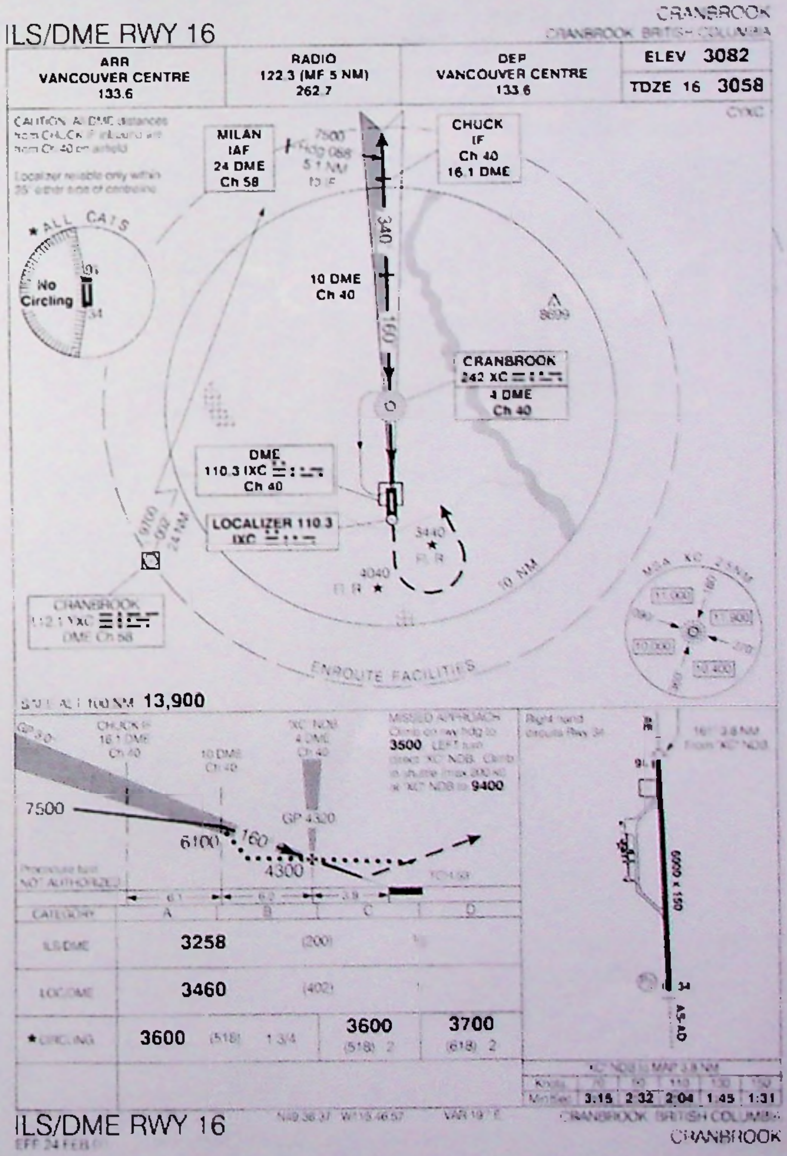
Fourth leg: KELOWNA (CYLW) >>> CRANBROOK (CYXC) Approx: 180 nm.

- Clock to 1800L.
- Weather: Overcast conditions 8/8 based 3500, visibility 3 nm in moderate rain, wind 200/15 (Again, if you pick "Gray and Rainy from the Weather main menu, it will be almost right on. Just adjust the wind).
- Tune in the KELOWNA (LW) NDB freq 257 on the ADF and dial in the CRANBROOK (YXC) VOR frequency 112.10 on NAV 2.
- Taxi to and T/O RWY 15, climb RWY Heading to 5000 followed by a right hand turn to HDG 333. Home the LW NDB to on top and continue climbing to 19,000.
- On top the LW NDB turn right HDG 082 and track the YXC VOR to on top.
- Enroute, tune in the SKOOKUM (SX) NDB frequency 368. Also dial in the LOC IXC frequency 110.3 and set course 160 on our NAV 1 OBI in preparation for an ILS/DME to RWY 16 at Cranbrook (Actual course 160, elevation 3082, RWY length 6000)(If you can, tune in the XC NDB frequency 242 on the STBY ADF frequency selector).
- 30 nm out of the YXC VOR descend to 11,000.
- Over the YXC VOR turn left HDG 006, descend to 9200 and home the SKOOKUM NDB to on top.
- On top the SX NDB, continue outbound HDG 006 for 90 seconds then left hand turn to HDG 185 back to the NDB inbound.
- Over the SX NDB turn left HDG 160, intercept the LOC and begin descent to 4300. Tune in the CRANBROOK (XC) NDB frequency 242. Do not descend below 4300 until past the XC NDB.
- 5 nm back, you are cleared for a full stop to RWY 16. Check gear down and locked.

LAND at Cranbrook and backtrack to the terminal located the NW of the airport.

Welcome home

END



Pilatus climbing out of Kelowna

A little more background on this article:

The British Columbia interior is a region comprised of very mountainous and rugged terrain. NDBs are usually the primary navigation aid for small airplanes. As for the Pilatus PC-12, it is a formidable airplane, originating in Europe, and originally designed for flying in the Alps. This makes it a perfect fit for the Canadian Rockies. The PC-12 is very powerful, with its long nose mounted Turbo prop engine, and sporting a huge propeller. I had the great pleasure of watching this airplane fly in and out of Oliver for 2 weeks in September 2006. I've included a couple of pictures which can be found in the magazine "Download area"

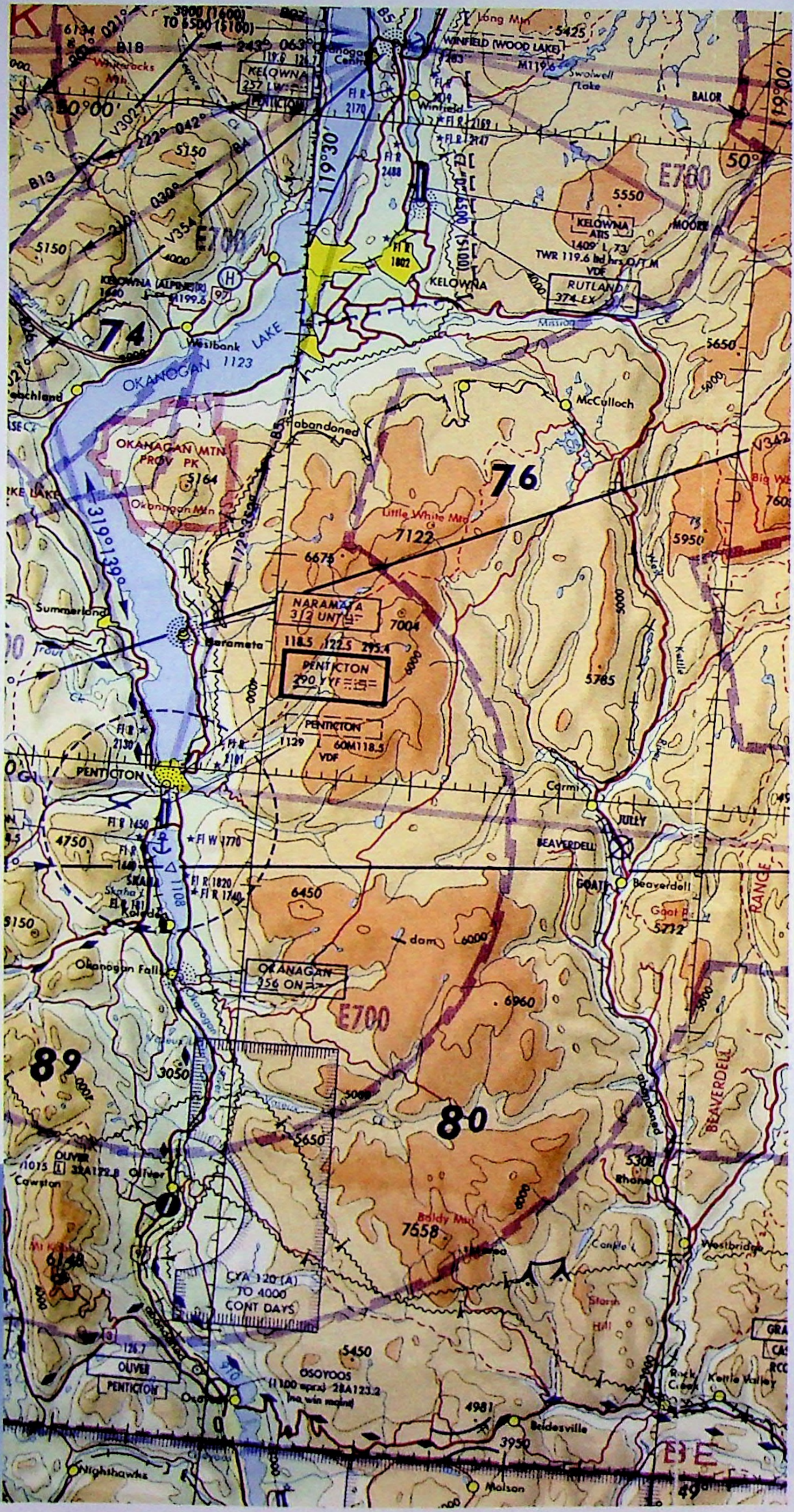
Al's thank you box:

Without the people below and our payware/ freeware designers, I couldn't write these articles. So my sincere thanks to all those and to flightsim.com and avsim.com

1. Quotes and photos from Airways magazine are courtesy of and with permission of the Editor. Many thanks!
2. To Chris Squire for test flying the route. Chris is a retired military pilot with over 12,000 hours of flying time.
3. I use FSNavigator for all by flight planning, a courtesy of the FS Navigator team.
4. To Justin Tyme (FSGENESIS.NET) and to Ruud Faber (www.fscene.com) for the great terrain textures, that make my writing so much more enjoyable.
5. to Miguel Blaufuks of SIMMARKET. COM for the great scenery. (www. simmarket.com)
6. To the Flight1 team for the complimentary Pilatus PC-12. Just awesome!
7. To AVSIM and FLIGHTSIM.com for being there!

Cheers and keep on reading Computer Pilot

Al ✈



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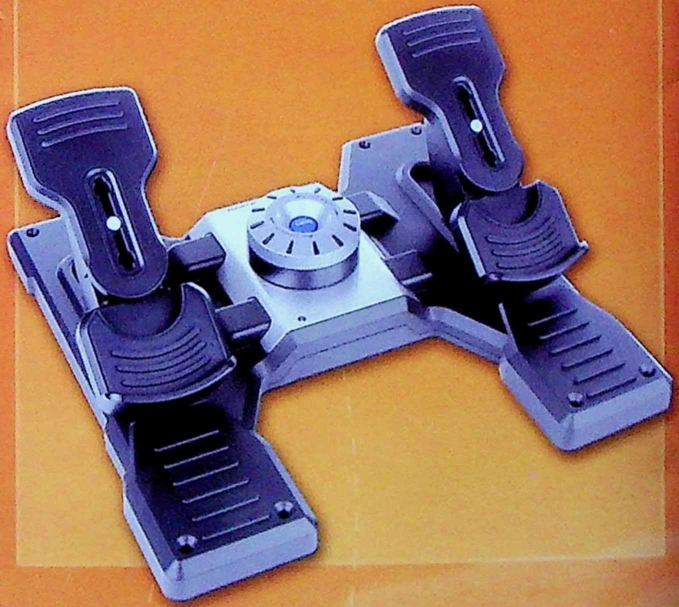

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